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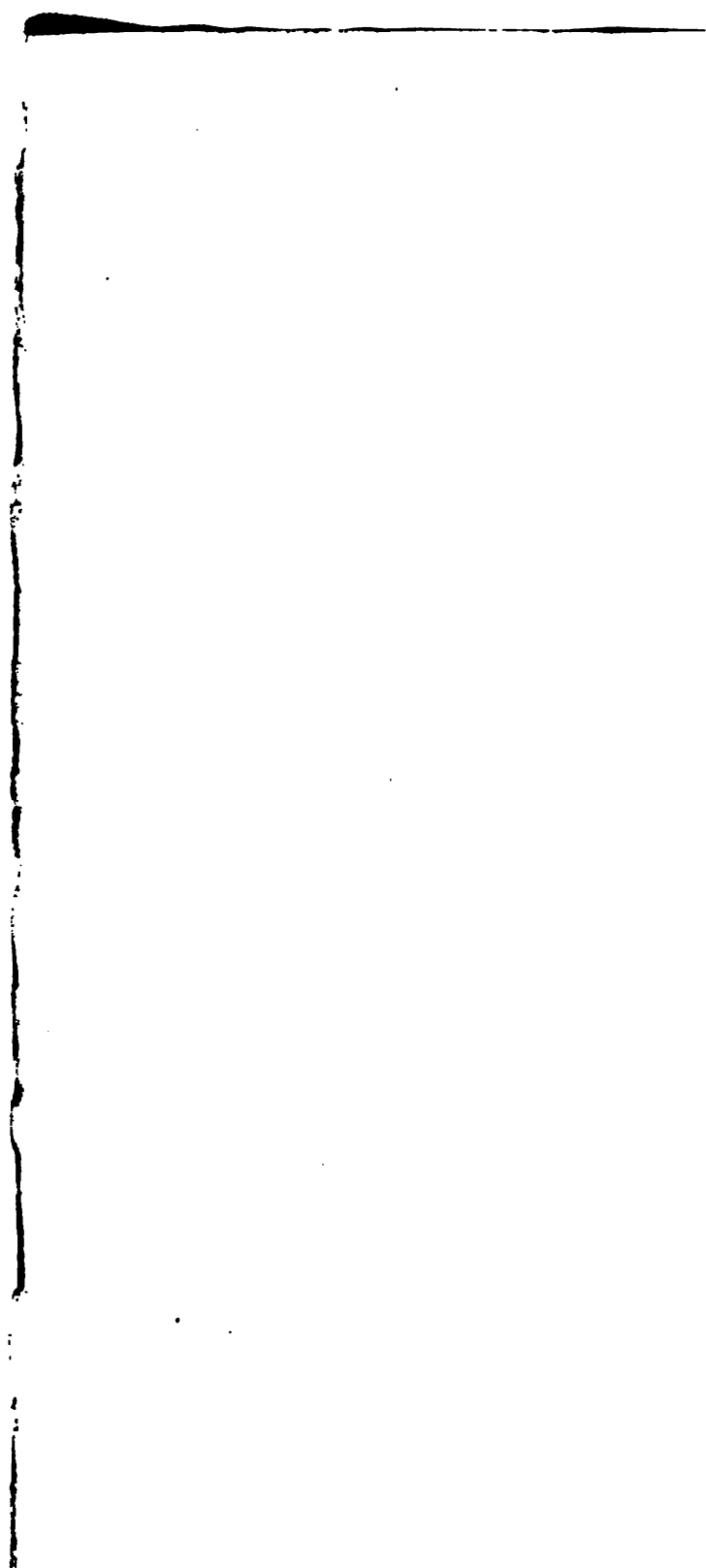
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1900



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ANNUAL REPORTS

OF THE

VAR DEPARTMENT

1901-2

FOR THE

FISCAL YEAR ENDED JUNE 30, 1901.

REPORTS OF CHIEFS OF BUREAUS.

WASHINGTON:
GOVERNMENT PRINTING OFFICE.
1901.

ARRANGEMENT OF THE ANNUAL REPORTS OF THE WAR DEPARTMENT FOR THE YEAR ENDED JUNE 30, 1901.

VOLUME I. Parts 1-10.—Report of the Secretary of War and all other reports except those of the Chief of Engineers and the Chief of Ordnance.

VOLUME II. Parts 1-5 and Supplement.—Report of the Chief of Engineers.

VOLUME III. Report of the Chief of Ordnance.

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- Board of Ordnance and Fortification.
- Commissioners of National Military Parks:
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- United States Military Academy, West Point, N. Y.:
 - Board of Visitors.
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- Soldiers' Home, District of Columbia:
 - Board of Commissioners.
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- National Home for Disabled Volunteer Soldiers.
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- Chief of Division of Insular Affairs.

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**REPORT OF THE ADJUTANT-GENERAL TO
THE SECRETARY OF WAR.**

ANNUAL REPORT

OF THE

ADJUTANT-GENERAL OF THE ARMY.

WAR DEPARTMENT,
ADJUTANT-GENERAL'S OFFICE,
Washington, October 15, 1901.

SIR: The following returns of the Regular Army and of the United States Volunteers for the fiscal year ended June 30, 1901, are respectfully submitted:

A.—Strength of the Regular Army of the United States June 30, 1900, and June 30, 1901, with losses from all causes between those dates.

B.—Strength of the Army, by divisions, departments, etc., between July 1, 1900, and June 30, 1901.

C.—Statement showing the monthly strength and losses from all causes in the armies of the United States between July 1, 1900, and June 30, 1901.

D.—Table showing the organization, service, and strength of the United States Volunteers, authorized by the act of March 2, 1899, with losses from all causes as shown by muster-out rolls.

E.—Deaths in the armies of the United States between July 1, 1900, and June 30, 1901.

F.—Dates of sailing and troops sent to Philippine Islands.

G.—Retirements, resignations, deaths, etc., among officers between October 1, 1900, and October 1, 1901.

Distribution of the Army September 25, 1901.

Country.	Officers.	Enlisted men.	Total.
United States.....	1,922	31,952	33,874
Philippine Islands.....	1,111	42,128	43,239
Cuba.....	166	4,748	4,914
Porto Rico.....	51	1,490	1,541
Hawaiian Islands.....	6	250	256
China.....	5	157	162
Alaska.....	17	510	527
Total.....	3,278	81,235	84,513

In this table are included 4,336 men of the Hospital Corps and 25 officers and 815 men of the Porto Rico Provisional Regiment, leaving the strength of the Regular Army 3,253 officers and 76,064 enlisted men.

In addition there are also in the Philippines 172 volunteer surgeons, appointed under section 18 of the act of February 2, 1901, and 73 officers and 4,973 native scouts.

The regiments in the Philippines will be reduced by the expiration of terms of enlistment as follows:

October, 1901	665
November, 1901	2,360
December, 1901	3,017
January, 1902	2,512
February, 1902	2,163
March, 1902	3,543
April, 1902	2,224
May, 1902	1,511
June, 1902	2,492
Total	20,487

General Chaffee has been given instructions to assemble these men in Manila in sufficient time for them to be sent to San Francisco for discharge and final payment. They will come under command of officers returning from their commands on leave or otherwise. The question of the strength at which the regiments in the Philippines are to be maintained is one requiring the early consideration of the War Department. If to be kept at their present strength, it is time to begin special recruiting for them. The verbal instructions of the Secretary of War to have them reduced so as the strength of the entire Army shall not exceed 76,000 is being carried into effect and will be fully accomplished at an early date.

Deaths in the armies of the United States between July 1, 1900, and June 30, 1901.

	United States.		Cuba.		Alaska.		Porto Rico.		Hawaiian Islands.	
	Officers.	Enlisted men.	Officers.	Enlisted men.	Officers.	Enlisted men.	Officers.	Enlisted men.	Officers.	Enlisted men.
Regular Army	7	237	3	64	...	7	...	5	...	1
United States Volunteers	4	100	3	...	...	...	1	13	1	4
Total	11	337	6	64	...	7	1	18	1	5

	Philippine Islands.		China.		Japan.		At sea.		Total.	
	Officers.	Enlisted men.	Officers.	Enlisted men.	Officers.	Enlisted men.	Officers.	Enlisted men.	Officers.	Enlisted men.
Regular Army	20	664	3	99	...	11	...	41	33	1,129
United States Volunteers	18	611	...	...	1	2	...	74	28	804
Total	38	1,275	3	99	1	13	...	115	61	1,933

^a Four officers of the Regular Army who died also held commissions in the volunteer forces and are to avoid counting them twice, deducted from the aggregate.

The losses from all causes in the Regular Army and in the United States Volunteers from July 1, 1900, to June 30, 1901, were as follows:

	Resigned or dis- charged.	Retired.	Dis- missed.	Dis- charged.	Died.	Deserted.	Miss- ing.	Total.
REGULAR ARMY.								
Officers	15	67	1	133	1,129	3,110	8	1116
Enlisted men		276		12,286				16,808
Total	15	342	1	12,286	1,162	3,110	8	16,924
UNITED STATES VOLUNTEERS.								
Officers	278		4	804	28	1	2	1813
Enlisted men				6,900		57	15	7,776
Total	278		4	6,900	832	58	17	8,089
Grand total	293	342	5	19,186	1,990	3,168	25	25,009

^a Four officers of the Regular Army who died also held commissions in the volunteer forces, in which they are included, and to avoid counting them twice that number is deducted from the aggregate.

The total number of troops that served in the Philippine Islands between June 30, 1898 (date of first arrival of United States troops), to June 30, 1901, was as follows:

	Officers.	Enlisted men.
Regular Army	1,342	60,938
United States Volunteers	2,135	47,867
Total	3,477	108,805

The casualties from all causes in that country during the above period were as follows:

Cause.	Regular Army.		United States Vol- unteers.		Total.		Aggre- gate.
	Officers.	Men.	Officers.	Men.	Officers.	Men.	
Killed	28	261	22	388	50	649	699
Died of—							
Wounds	6	78	6	129	12	207	219
Disease	18	1,082	18	1,028	36	2,110	2,146
Accident	1	61	4	38	5	99	104
Drowned	1	128	4	61	5	189	194
Suicide	2	35	4	15	6	50	56
Murder or homicide	1	46		28	1	74	75
Total deaths	57	1,691	58	1,687	115	3,378	3,493
Wounded ^a	49	993	133	1,653	182	2,646	2,828

^a The number of "Died of wounds" is included in the number of "Wounded."

The casualties among the commissioned officers of the Army between October 1, 1900, and October 1, 1901, are as follows:

	Re- tired.	Wholly retired.	Re- signed.	Honora- bly dis- charged.	Died.		D m
					Active list.	Retired list.	
General officers.....	6						
Adjutant-General's Department.....	2						
Judge-Advocate-General's De- partment.....	3						
Quartermaster's Department.....	3		3		1		
Subsistence Department.....	3				1		
Medical Department.....	6		1		4		
Pay Department.....	2		1				
Corps of Engineers.....	4				1		
Ordnance Department.....	2						
Chaplains.....	1		1				
Professor, Military Academy.....					1		
Cavalry.....	10				6		
Artillery.....	6		1		2		
Infantry.....	22	1	9	1	13		
Brigadier-generals.....						5	
Colonels.....						10	
Lieutenant-colonels.....						3	
Majors.....						7	
Captains.....						14	
First lieutenants.....						5	
Captain, retired.....							
Total.....	69	1	16	1	29	44	

The statistics of desertions during the year ended June 1, 1901, show the gratifying fact that, with an average enlisted strength of 71,173 men, the number of desertions reported (3,110) is only 4.36 per cent of the average strength, while for the last six months of the period, the average strength being 74,405, the number of desertions occurring (1,400) further reduced the rate to 1.9 per cent, the lowest rate ever reported in the history of the Army.

THE REGULAR ARMY.

In view of the provisions of the act of March 2, 1899, requiring the muster out of the United States Volunteers not later than June 1, 1901, and of the utter inadequacy of the Regular Army at that date to meet existing conditions, Congress, by the act of February 26, 1901, authorized its increase, on the basis of a 3-battalion organization, to 15 regiments of cavalry, 1 corps of artillery, and 10 regiments of infantry, together with a suitable increase in the several departments. The artillery corps (substituted for the existing mental organizations of the artillery arm of the Army) to consist of two branches—the coast artillery and the field artillery; the first corps, selected from the colonels of artillery, to serve on the staff of the Lieutenant-General Commanding. The coast artillery to consist of 126 batteries and the field artillery of 30 batteries, the total number of enlisted men not to exceed 18,920, exclusive of 1,000 civilian sergeants, and the increase provided for the artillery to be as follows: Not less than 20 per cent before July 1, 1901, and not less than 20 per cent in each succeeding year until the entire number shall have been attained. Section 30 of the act above mentioned authorizes the President to maintain the enlisted force of the organizations of the Army at their maximum strength during the present exigencies of the service, or until such time as Congress shall otherwise direct.

All reports evince that the officers and men are in a good state of discipline. The enlisted men have never been of a higher character. The fact that from the ranks during the year, after careful and rigorous physical and mental examination, two hundred have been commissioned second lieutenants in the Regular Army, speaks volumes for their intelligence and high soldierly bearing.

The general orders to govern the above organization of the Army will be found in the appendix to this report.

PHILIPPINE SCOUTS.

By section 36 of the act of February 2, 1901, the President was authorized to enlist natives of the Philippine Islands for service as scouts and to organize them under officers of the Army into companies, squadrons, or battalions, the total number of enlisted men in the native organizations not to exceed 12,000 men; the total enlisted force of the Army, together with such native force not to exceed 100,000 at any one time.

PORTO RICO REGIMENT.

Section 37 of the same act authorizes the organization of one provisional regiment of not exceeding three battalions, for service in Porto Rico, the enlisted strength to be composed, as far as practicable, of natives of that island, and the regiment to continue in service until further directed by Congress.

UNITED STATES VOLUNTEERS.

The act of March 2, 1899, authorizing the President to raise a force of not more than 35,000 volunteers, but providing that this increased force should not be continued in service later than July 1, 1901, made it advisable that all volunteer enlistments authorized by the law quoted should terminate June 30, 1901. The provisions of the act were duly carried into effect as herein indicated.

The following instructions will indicate the care taken by this Department to govern the integrity of the records and guard the rights of all concerned:

HEADQUARTERS DIVISION OF THE PHILIPPINES,
Manila, P. I., September 29, 1900.

Maj. S. C. MILLS,

Acting Inspector-General, Division of the Philippines.

(Through Adjutant-General.)

SIR: Replying to your letter of the 22d instant, I have the honor to say that it will greatly facilitate the work of discharging the volunteers if the several inspectors-general of the division are authorized, as you suggest, to bring to the notice of the regimental and company commanders some of the points and questions that most frequently arise and call for determination by mustering officers.

Briefly stated, the muster-out roll of a company or of the field, staff, and band is a concise descriptive record of the whole period of service of each individual officer or soldier who has at any time belonged to it, together with a complete exhibit of his final account, whatever the date his connection with the organization may have terminated. It is, therefore, of the first importance to ascertain if the names of all such officers and men appear in the descriptive book, requiring entry in cases of omission. Men enlisted in the regiment who were soon discharged as unsuited to the service, deserted, were transferred, etc., even before preparation of organization rolls, can not be ignored. If assigned to companies being formed, they should be accounted for in company descriptive books; if unassigned, the regimental commander takes them up correspondingly in the regimental records and at muster out carries them

at the foot of the roll of the field, staff, and band as "Recruits unassigned to companies."

Records already examined show an average of 100 to 150 men lost as above to each regiment during organization, and in many instances their names are not entered in any clothing and descriptive book. Inspectors may well remind company and other commanders that a soldier once enlisted in or assigned to an organization, even though he may die, desert, be transferred or discharged the day following, has an accrued pay and clothing and perhaps other account that must be exactly stated on the muster-out rolls. It should therefore be properly set forth in the records from which the rolls are to be made.

As will readily be seen, the descriptive book, with its accompanying clothing accounts, is the key to the situation in the mustering officer's work. So far as at present known, the plan of the War Department contemplates preparation of the muster-out rolls on board the transports while regiments are returning to the United States, and it is desired to have this book in each company and at regimental headquarters so complete and accurate in the information required that it may be necessary to refer to almost no other book or paper in making up the rolls. By setting apart an additional space for "Remarks" for each officer and soldier, utilizing for the purpose a quarter or half section of one of the numerous blank pages, with proper index reference thereto, the clothing and descriptive book becomes a ledger into which are condensed all accounts and essential facts in the military history of the individual concerned. Such entries should comprise, among other data needed for the muster-out rolls, the following, whenever pertinent to any name:

1. When, where, and by what authority an officer or soldier originally joins for duty.
2. All cases of sickness, either in quarters or hospital, specifying dates, inclusive, and whether or not in line of duty.
3. All trials by summary court, with dates and sentences; all trials by general courts-martial, with sentences and reference to orders publishing proceedings; all cases of fines imposed by either, noting on what pay rolls same deducted.
4. Each deposit by a soldier to be separately stated, giving date, name of pay master, and amount.
5. Notation of extra or special duty, detached service, changes in rank or grade, leaves of absence and furloughs, with number, source, and date of order in each case.
6. Cases of arrest by civil authority, showing place and period, together with offense charged, and whether tried and convicted, or acquitted, or released without trial.
7. Any particular incident in an officer or soldier's service deserving mention, a not included in the general "Record of events" of the company or regiment.

While information should be noted as above indicated, so far as practicable, in the case of every commissioned officer and enlisted man who has at any time been a member of an organization, further and important action should be taken to complete the final records and accounts of those who have ceased to belong to it. The descriptive and clothing accounts should be closed, and the same observance of accuracy in all details as though involving a full period of service and presence with command at muster out. Discharge, death, or desertion of course call for settlement of a soldier's clothing account to date of the event, showing balance due soldier in the United States. When transferred, the soldier's clothing account is stated, settled, and the muster-out roll must show—as the clothing book should—when (if ever) settled, and the money value of clothing drawn since settlement (or enlistment) to date of transfer. Particular remarks in the descriptive book, where services or accounts have been terminated, should set forth:

In case of transfer:

- (a) Date, place, and to what organization, with number, source, and date of order.
- (b) Descriptive list furnished.
- (c) Character.
- (d) Physical condition.
- (e) Whether service honest and faithful.
- (f) To what date, and by whom last paid.
- (g) Dues to the United States for ordnance, quartermaster or subsistence or other charges or credits, together with any further data entered in descriptive list not already of record.

In case of discharge:

- (a) Date, place, and authority. If on surgeon's certificate of disability, with nature and degree of disability.
- (b) Discharge, and final statements given.
- (c) Character.
- (d) Physical condition.

In case of discharge—Continued.

- (e) Whether service honest and faithful.
- (f) Whether entitled to travel pay.
- (g) To what date, and by whom last paid.
- (h) Dues to the United States for ordnance, quartermaster or subsistence stores, or other charges or credits, together with any further data entered on final statements or discharge certificate not already of record.

In case of death:

- (a) Date, place, and cause; latter to be explicitly stated.
- (b) Inventory of effects, deposit book (if any), and final statements forwarded to the Adjutant-General.
- (c) Character as a soldier to be noted.
- (d) Whether service faithful and honest.
- (e) To what date, and by whom last paid.
- (f) Dues to the United States for ordnance, quartermaster or subsistence stores, or other charges or credits.
- (g) Disposition of remains, whether by burial and where, with number of grave, or by shipment for delivery to relatives.
- (h) Disposition of effects, whether by council of administration or delivery to legal representatives.
- (i) Any other data entered on final statements not already of record.

In case of desertion:

- (a) Date and place. Ordinarily the date of desertion is that on which a soldier absents himself from his command and not the later date when, the act of desertion established, he is dropped from the rolls.
- (b) Character prior to desertion to be noted.
- (c) Physical condition.
- (d) To what date and by whom last paid.
- (e) Dues to the United States for ordnance, quartermaster or subsistence stores, or other charges, or credits.
- (f) Men gained from desertion by apprehension, surrender, etc., are properly taken up and new accounts opened for them in the clothing and descriptive book as are men gained from other sources.

In descriptive books that have been examined an average of 20 to 40 names appear (or, it has been found, should appear) on the casualty pages for the register of men "Transferred," "Discharged," "Died," and "Deserted." If a book is correctly maintained according to its purpose, the sum of casualties reported under the four headings deducted from the whole number of individual descriptive accounts in the body of the book gives a balance agreeing with the "Total enlisted, present and absent," of the morning report on the day of inspection. A discrepancy shown by this test calls for inquiry to discover omissions or erroneous entries, and is generally determined by consulting early or later records, such as the organization and subsequent muster rolls, the morning reports, assignment cards, and even clothing schedules, it being constantly borne in mind, as already stated, that every individual who has ever belonged to the organization must be fully accounted for in this book preparatory to similar action in his case on the muster-out rolls.

Apart from special questions relating to muster out herein touched upon, it gives me pleasure to say that in general, so far as I have had the opportunity to observe, the books and records of the volunteer regiments show creditable adherence to the regulations, with due attention by the officers concerned to instructions affecting them received through your department. Among some of the irregularities noted, however, may be mentioned the following:

1. Medical officers do not in all cases state in sick report book that sickness is or is not in line of duty.

2. Two very common errors are to give dates and quote orders inexactly, it being stated, for example, that an event occurred March 3, or May 21, the year not mentioned, and in pursuance of "Special Orders 72," without specifying the source and date of the order.

3. Some officers attach descriptive lists received to pages of the clothing and descriptive book, whereas pertinent matter that such lists contain should be copied into the book and the descriptive lists filed.

4. Retained pay rolls rarely bear in the columns and allotted space above signatures the names of the paymasters who paid them, nor are stoppages and amounts paid always entered in ink.

5. In many instances, in the three regiments organized in this division, the important paper known as the organization roll has not been prepared. In each case of a company or the field, staff, and band where the neglect continues the rolls should be

made up at once, in duplicate, one copy to be forwarded to the Adjutant-General of the Army, the other retained. The roll may be given a current date. In the body of it should be entered the names of officers and men now belonging to the organization, followed at the foot of the roll by the names, under appropriate headings, of all who have ceased to belong to it.

6. Clothing schedules occasionally lack one or more of the three official signatures required at the foot to constitute them complete vouchers.

7. The integrity of names is not scrupulously preserved. A man enlisted under the name of John W. Smith is perhaps carried in official records as John Smith or J. W. Smith, Willson as Wilson, etc., and the men improperly permitted like irregularities in their signatures. Company and other commanders should critically compare records subsequent to the organization roll for the detection of errors of this nature and with reference to the requirement that soldiers must be discharged or mustered out under their names as given at enlistment unless authority for change has been granted from the War Department.

8. Separate, distinct, and carefully preserved files of the different classes of official papers are important. These include letters, orders, descriptive lists, and communications or papers of whatever nature received, together with clothing schedules, retained monthly returns, muster rolls, pay rolls, etc. Such files are not invariably maintained with the care that is desirable.

At muster out all books of record and official papers of every description are delivered to the mustering officer for transmission to the War Department. As they are required to be correct and complete as far as practicable in all minor as well as important details, it must be evident to all concerned that attentive application in advance to that end will save infinite labor and annoyance during the short period allotted for discharge after assembly for that purpose.

Very respectfully,

S. P. JOCELYN,

Lieutenant-Colonel, Twenty-fifth United States Infantry.

In view of the large number of convalescent volunteers in the army general hospitals, particularly at San Francisco, and of the fact that the terms of service of these men, if returned to their respective organizations, would necessarily be brief, instructions were issued September 6, 1900, by order of the Secretary of War, for the discharge of all convalescent volunteers who were able to travel with comfort and safety, their service being no longer required; and that to avoid confusion and guard against loss of records, the descriptive lists of these discharged men were to be listed by regiments, filed at headquarters of the Department of California, to be turned over to the respective regimental commanders upon their arrival at San Francisco.

At the urgent request of General MacArthur, authority was granted December 17, 1900, for the retention of all regular officers serving under volunteer commissions, whose regular organizations were stationed in the Philippine Islands, and also for the retention to June 30, 1901, of volunteer officers assigned to special duty and who desired to remain. Authority was also granted for the discharge of all volunteer regimental medical officers who desired to remain in the Philippines and accept employment as contract surgeons; but instructions were issued that care must be taken in every case that no transport sailing with returning volunteers left Manila without ample and competent medical attendants.

The question of the place at which the muster out of the regiments should take place received most careful consideration, and San Francisco was, on the expressed wish of the officers and men, selected as the point at which this should be effected.

The report of the commanding-general, Department of California, shows that the muster out in every case was "quiet, orderly, and without incident," and that the number of the men mustered out who immediately purchased railroad tickets to their respective homes was fully 97 per cent.

Another subject of great importance was an efficient medical examination of the troops prior to muster out, in order to secure a correct record of the physical condition of each man as it then existed, with a view to aid the settlement of future applications for pensions. The following table exhibits the results of the examinations. It will be noted that 18,117 individuals, or over 81 per cent of the total present, make no claim of disability, although upon examination 100 of this number were found disabled, 4,168 claimed disability, and of this number, 485 claims were allowed; in 3,599 cases disability was found not to exist, and in the remaining 83 cases disability was found to exist, but not contracted in the line of duty.

Claims for disability contracted in the line of duty were allowed in but 586 cases, less than 3 per cent of the total number present for muster out.

Consolidated report of the result of the physical examination, at San Francisco, of the officers and enlisted men of the 25 regiments of United States Volunteers present at muster out.

Regiments.	Strength.	No disability claimed.		Disability claimed.		
		Disability found.	No disability found.	Disability found.	No disability found.	Disability found, but not in line of duty.
Eleventh Volunteer Cavalry.....	585	2	455	8	120	.....
Twenty-sixth Volunteer Infantry.....	964	19	773	59	96	18
Twenty-seventh Volunteer Infantry.....	891	5	711	14	160	1
Twenty-eighth Volunteer Infantry.....	1,077	2	927	12	135	1
Twenty-ninth Volunteer Infantry.....	903	5	761	23	108	6
Thirtieth Volunteer Infantry.....	778	.....	487	17	274	.....
Thirty-first Volunteer Infantry.....	1,070	4	956	26	80	4
Thirty-second Volunteer Infantry.....	693	2	541	16	122	12
Thirty-third Volunteer Infantry.....	799	5	598	14	180	2
Thirty-fourth Volunteer Infantry.....	805	2	505	26	272	.....
Thirty-fifth Volunteer Infantry.....	852	1	689	9	151	2
Thirty-sixth Volunteer Infantry.....	582	2	396	16	165	3
Thirty-seventh Volunteer Infantry.....	671	5	456	19	184	8
Thirty-eighth Volunteer Infantry.....	969	1	811	19	137	1
Thirty-ninth Volunteer Infantry.....	684	1	513	12	155	3
Fortieth Volunteer Infantry.....	938	2	818	11	107	.....
Forty-first Volunteer Infantry.....	913	.....	792	19	102	.....
Forty-second Volunteer Infantry.....	897	4	760	8	125	.....
Forty-third Volunteer Infantry.....	1,045	9	893	25	118	.....
Forty-fourth Volunteer Infantry.....	1,061	4	910	22	122	3
Forty-fifth Volunteer Infantry.....	968	5	728	33	218	9
Forty-sixth Volunteer Infantry.....	892	14	762	26	82	8
Forty-seventh Volunteer Infantry.....	967	2	829	24	131	1
Forty-eighth Volunteer Infantry.....	1,127	.....	979	18	130	.....
Forty-ninth Volunteer Infantry.....	1,114	4	968	10	131	1
Total.....	22,285	100	18,017	486	3,599	83

General Orders, No. 17, Headquarters of the Army, dated February 15, 1901 (see Appendix), contain minute instructions for the muster out of the several organizations on their arrival at San Francisco.

The Eleventh Cavalry, Thirty-sixth and Thirty-seventh Infantry, having been organized in the Philippine Islands, were, to a large extent, composed of former members of State volunteer organizations who had accepted discharges in the Philippines and immediately reenlisted. Upon examination of the rolls of these regiments it was ascertained that 33 officers and 195 enlisted men of the Eleventh Cavalry, 40 officers and 436 enlisted men of the Thirty-sixth Infantry and 36 officers and 439 enlisted men of the Thirty-seventh Infantry had reentered the service in the Philippine Islands. To enable the officers and

men of the above-mentioned regiments to receive travel allowances upon muster out, especially in view of their efficient service. Congress, on the recommendation of the War Department, passed the act of February 8, 1901, which is embodied in General Orders, No. 16, Headquarters of the Army, dated February 17, 1901. (See Appendix.)

It having become almost certain that some of the organizations would not reach San Francisco until after July 1, making it impossible, by muster out before that date to do full justice to the interests of the Government and to such volunteers equal to that extended to earlier arrivals, the Secretary of War directed that they be retained in service for the convenience of the Government for such length of time after July 1 as might be necessary to accomplish the above object—the date of discharge and of payment to be the actual date of muster out.

The following are the organizations mustered out subsequent to June 30, 1901:

Company B, Thirty-eighth Volunteer Infantry, mustered out July 5, 1901; Forty-first Volunteer Infantry, mustered out July 3, 1901; Company B, Forty-second Volunteer Infantry, mustered out July 8, 1901; Forty-third Volunteer Infantry, mustered out July 5, 1901; Forty-seventh Volunteer Infantry, mustered out July 2, 1901.

Under the instructions of December 11, 1900, the volunteer organizations left Manila and arrived at San Francisco at the dates indicated in the following table, which gives also the strength of the regiments present at muster out as telegraphed to this office by the chief mustering officer.

Organization.	Departure from Manila.	Transport.	Arrival at San Francisco.	Date of muster out.	Strength at muster-out in San Francisco.		
					Officers.	Men.	Total.
Eleventh Volunteer Cavalry.	1901. Feb. 1	Meade.....	1901. Mar. 1	1901. Mar. 13	22	557	579
Twenty-sixth Volunteer Infantry.							
H. Q.; Companies A, B, C, D, E, G, H, I, K, L, M.	Mar. 9	Garonne.....	Apr. 20	May 13	43	925	
Company F.....	Mar. 23	Grant.....	Apr. 19	do			
Twenty-seventh Volunteer Infantry.	Feb. 10	Buford.....	Mar. 13	Apr. 1	27	867	
Twenty-eighth Volunteer Infantry.	Mar. 16	Thomas.....	Apr. 14	May 1	32	1,042	1,074
Twenty-ninth Volunteer Infantry.	Mar. 23	Grant.....	Apr. 19	May 10	34	871	
Thirtieth Volunteer Infantry.	Feb. 17	Hancock.....	Mar. 12	Apr. 3	26	738	
Thirty-first Volunteer Infantry.	May 18	do.....	June 9	June 18	32	1,010	
Thirty-second Volunteer Infantry.	Mar. 23	Grant.....	Apr. 19	May 8	26	662	
Thirty-third Volunteer Infantry.	Mar. 1	Logan.....	Mar. 29	Apr. 17	26	77	
Thirty-fourth Volunteer Infantry.	do	do	do	do	24	71	
Thirty-fifth Volunteer Infantry.							
H. Q.; First and Third battalions.	Mar. 16	Thomas.....	Apr. 14	May 2	36		
Second Battalion.....	do	Rosecrans.....	Apr. 18	do			
Thirty-sixth Volunteer Infantry.	Jan. 28	Pennsylvania.....	Mar. 2	Mar. 16	17		
Thirty-seventh Volunteer Infantry.	Jan. 10	Sheridan.....	Feb. 6	Feb. 20	27		
Thirty-eighth Volunteer Infantry.							
H. Q.; 3 companies.....	May 27	Thomas.....	June 26	June 30	33		
2 battalions.....	May 31	Logan.....	June 25	do			
Company B.....	June 1	Thyra.....	July 1	July 5			
Thirty-ninth Volunteer Infantry.	Mar. 16	Lawton.....	Apr. 17	May 6	29		

Organization.	Departure from Manila.	Transport.	Arrival at San Francisco.	Date of muster out.	Strength at muster-out in San Francisco.		
					Officers.	Men.	Total.
Fortieth Volunteer Infantry.	1901. May 22	Pennsylvania	1901. June 17	1901. June 24	34	907	941
Forty-first Volunteer Infantry.	May 18	Buford	June 26	July 3	24	888	912
Forty-second Volunteer Infantry:							
Company H.....	do	Aster	June 19	June 24	35	863	898
H. Q.; Companies A, C, D.	May 29	Ohio	June 21	June 27			
E, F, G, I, K, L, M.							
Company B.....	May 26	Kintuck	July 3	July 8	37	1,000	1,037
Forty-third Volunteer Infantry.	June 5	Kilpatrick	June 27	July 5			
Forty-fourth Volunteer Infantry.	May 31	Logan	June 25	June 30	37	1,051	1,088
Forty-fifth Volunteer Infantry.	Apr. 22	Sheridan	May 17	June 3	35	956	991
Forty-sixth Volunteer Infantry.	do	do	do	May 31	34	863	897
Forty-seventh Volunteer Infantry.	May 27	Thomas	June 26	July 2	34	969	1,003
Forty-eighth Volunteer Infantry.	June 2	Grant	June 24	June 30	40	1,093	1,133
Forty-ninth Volunteer Infantry:							
H. Q. and 2 battalions.	do	do	do	do	43	1,061	1,104
1 battalion	May 27	Thomas	June 26	do			
Total					785	21,548	22,335

The following tables are compiled from the general field returns of the volunteer regiments, as telegraphed to this office by the commanding general of the Department of California immediately after the arrival of the several organizations at San Francisco.

I. COMMISSIONED OFFICERS.

Regiments.	Promoted from the ranks.	Total on rolls.	Casualties.										Remaining to be mustered out.
			Resigned.	Discharged.	Died of disease.	Killed.	Drowned.	Transferred.	Dismissed.	Vacated by new appointment.	Absent.	On detached service.	
Cavalry: Eleventh.	5	56	4	3	1								48
Infantry:													
Twenty-sixth	4	54	2			1	1	1					49
Twenty-seventh	15	64	7	4		1			1	2			49
Twenty-eighth	6	56	2	4	2						17		31
Twenty-ninth	7	58	6	4									48
Thirtieth	7	57	5	6								18	28
Thirty-first	5	55	3	4									48
Thirty-second	7	58	1	6	1			3					47
Thirty-third	11	63	6	2	4					2			49
Thirty-fourth	7	60	7	3	2							26	22
Thirty-fifth	5	55	4		1								50
Thirty-sixth	20	62	5		2	2		2				1	50
Thirty-seventh	6	56	2	3	1								50
Thirty-eighth	4	54		6									48
Thirty-ninth	8	58	2	8	1	1							46
Fortieth	6	57	3	3	1	1		1					48
Forty-first	6	56	3	3								25	25
Forty-second	5	57	1	7	2								47
Forty-third	7	58	2	6	1	1		1					47
Forty-fourth	8	58	6	2		2							48
Forty-fifth	6	58	2	4		1	1	1					49
Forty-sixth	4	54		5									49
Forty-seventh	9	59	3	5	3	1							47
Forty-eighth	5	55	5	2									48
Forty-ninth	5	56	3	5									48
Total	178	1,434	80	99	22	11	2	9	1	4	17	69	1,119

The following tables are compiled from the general field returns of the volunteer regiments, as telegraphed to this office, etc.—Continued.

II. ENLISTED MEN

Regiments.	Total on rolls.	Casualties.												Remaining to be mustered out.	
		Discharged.	Killed or died of wounds.	Died of disease.	Deserted.	Transferred.	Missing.	Sick in the Philip- pines.	Remaining in the Philippines.	Absent without leave.	Spent in hospitals.	Accidental deaths.	Drowned.		Assassinated.
Cavalry—Eleventh	1,104	129	11	13	30										598
Infantry:															
Twenty-sixth.....	1,516	137	17	38	8										938
Twenty-seventh.....	1,522	198	13	26	2	12	2								873
Twenty-eighth.....	1,309	160	10	26	65										1,048
Twenty-ninth.....	1,471	108	13	29	36										994
Thirtieth.....	1,430	554	10	72	17		9	7	1						700
Thirty-first.....	1,401	236	1	29	33										1,041
Thirty-second.....	1,418	686	10	34	37		1		1	1	1	1	1		676
Thirty-third.....	1,450	505	29	39	27		3								848
Thirty-fourth.....	1,529	512	11	65	22	81	2	42							794
Thirty-fifth.....	1,309	126	11	36	1	2			1						826
Thirty-sixth.....	1,053	356	12	32	15	10									628
Thirty-seventh.....	1,062	224	17	69	12										640
Thirty-eighth.....	1,530	479	11	48	28							2			962
Thirty-ninth.....	1,235	478	11	107	17		3								679
Fortieth.....	1,494	473	33	31	15							1	1		940
Forty-first.....	1,611	568	1	30	110										902
Forty-second.....	1,552	520	4	40	52										866
Forty-third.....	1,466	307	52	20	71							2			1,011
Forty-fourth.....	1,420	297	22	18	17										1,066
Forty-fifth.....	1,297	227	18	31	10		3								1,088
Forty-sixth.....	1,406	442	8	42	39										875
Forty-seventh.....	1,568	441	15	32	104							1	2		970
Forty-eighth.....	1,459	190	1	50	4	113					6				1,105
Forty-ninth.....	1,583	453	11	37	10										1,072
Total.....	35,295	10,329	304	1,014	962	218	23	7	42	1	5	8	10	2	22,110

The difference in the number of officers and enlisted men as telegraphed to this office by the chief mustering officer upon the muster out of each regiment and those in the general field returns as telegraphed upon the arrival of the regiments is explained by the fact that authority was granted the commanding general, Division of the Philippines, to retain in the Philippine Islands all volunteer officers on special duty who desired to remain after the departure of their respective organizations, with a view to their discharge not later than June 30; also by the further fact that some officers and enlisted men were retained in the service in order to take the examination for commission, while a few enlisted men were discharged for urgent reasons after the arrival of their regiments at San Francisco and prior to the date set for muster out.

It is very gratifying to note from the reports made that the discipline of the volunteers while in camp was so uniformly good as to call for little criticism, fully justifying in that respect the wisdom of the method adopted of organizing them and of selecting the senior officers from the regular establishment. These officers were in every instance selected for purely military reasons. The line officers were selected on their efficiency records as volunteer officers. All in all, the Government has never had more satisfactory troops than these volunteers, and these troops are entitled to the gratitude of the people and the Government.

Eleventh Volunteer Cavalry.—This regiment was organized in the Philippines under telegraphic instructions to the commanding general of the then Department of the Pacific and Eighth Army Corps.

Twenty-sixth Volunteer Infantry.—Organized at Plattsburg Barracks, N. Y., by recruitment from the district embracing the New England States, excepting Connecticut, and the portion of the State of New York north of the forty-second degree of latitude; proceeded to San Francisco September 6, 1899, and arrived September 17; embarked on the transport *Grant* September 25, reaching Manila October 24, 1899.

Twenty-seventh Volunteer Infantry.—Organized at Camp Meade, Pa., by recruitment from the district embracing the State of Connecticut, the portion of the State of New York south of the forty-second degree of latitude, the States of Maryland, Virginia, West Virginia, North Carolina, and the District of Columbia; left camp August 30, 1899, and arrived at San Francisco September 6, and embarked on the transports *Tacoma* and *George W. Elder* September 21; the *Elder* arriving at Manila October 21, and the *Tacoma* October 27, 1899.

Twenty-eighth Volunteer Infantry.—Organized at Camp Meade, Pa., and recruited from the States of New Jersey, Pennsylvania, and Delaware; left for San Francisco September 25, 1899, arriving October 2; embarked on transports *Tartar* and *Newport* October 26, and reached Manila November 23, 1899.

Twenty-ninth Volunteer Infantry.—Organized at Fort McPherson, Ga., and recruited from the States of South Carolina, Georgia, Florida, Alabama, Mississippi, and Texas; left for San Francisco September 22, 1899, arriving September 28; embarked on transports *Zealandia* and *City of Para* October 5, the former arriving at Manila November 2, and the latter November 3, 1899.

Thirtieth Volunteer Infantry.—Organized at Fort Sheridan, Ill., and recruited from the States of Illinois, Michigan, and Wisconsin; left Fort Sheridan September 6, 1899, and arrived at San Francisco September 11, where on September 23 it embarked on the transport *Sherman*, and arrived at Manila October 21, 1899.

Thirty-first Volunteer Infantry.—Organized at Fort Thomas, Ky., and recruited from the States of Ohio, Indiana, Kentucky, and Tennessee; left for San Francisco August 26, 1899, and arrived September 3; embarked on the transports *Manauense* and *City of Peking* October 25-28, and arrived at Manila November 28, 1899.

Thirty-second Volunteer Infantry.—Organized at Fort Leavenworth, Kans., and recruited from the States of Iowa, Nebraska, Missouri, Kansas, Arkansas, the Indian and Oklahoma Territories; left Fort Leavenworth September 16, 1899, and arrived at San Francisco September 21; embarked September 30 and October 1 on the transports *Charles Nelson*, *Sheridan*, and *Glenogle*, and arrived at Manila October 27-29, 1899.

Thirty-third Volunteer Infantry.—Organized at Fort Sam Houston, Tex., and recruited from the States of Texas, Arkansas, the Territory of Oklahoma, and the Indian Territory; left for San Francisco September 15, 1899, where it arrived September 19; embarked on the transport *Sheridan* September 30, arriving at Manila October 27, 1899.

Thirty-fourth Volunteer Infantry.—Organized at Fort Logan, Colo., and recruited from the States of Minnesota, North and South Dakota,

Wyoming, Colorado, Utah, and the Territories of Arizona and New Mexico. Left Fort Logan August 29, 1899, and arrived at San Francisco September 3; part of the regiment embarked on the transport *Columbia* September 8, arriving at Manila October 11; the remainder of the organization embarked on the transport *Belgian King* September 16, and arrived at Manila October 14, 1899.

Thirty-fifth Volunteer Infantry.—Organized at Vancouver Barracks, Wash., and recruited from the States of Oregon, Washington, Idaho, California, and Nevada. Left for Portland, Oreg., October 3, 1899, arriving same day, and October 4 embarked on the transports *Sikh* and *City of Rio*, reaching Manila November 7, 1899.

Thirty-sixth and Thirty-seventh Volunteer Infantry.—Organized in the Philippines under telegraphic instructions to the commanding general of the Department of the Pacific and Eighth Army Corps; recruited from State volunteer organizations under orders to return to the United States for muster out, and from men in the regular service entitled to discharge by reason of the termination of the war with Spain.

Thirty-eighth Volunteer Infantry.—Organized at Jefferson Barracks, Mo. Left for San Francisco October 20, arriving October 27; embarked November 21 on the transports *Duke of Fife* and *St. Paul*, and arrived at Manila December 26, 1899.

Thirty-ninth Volunteer Infantry.—Organized at Fort Crook, Nebr. Left that post October 14, 1899, for Portland, Oreg., arriving October 19; embarked November 3 on the transports *Pennsylvania* and *Olympia*, and arrived at Manila December 7, 1899.

Fortieth Volunteer Infantry.—Organized at Fort Riley, Kans., leaving that post for San Francisco October 30, 1899, arriving November 5; embarked November 24 on the transports *Ohio* and *Indiana*, reaching Manila December 26, 1899.

Forty-first Volunteer Infantry.—Organized at Camp Meade, Pa., left November 18, 1899, for New York City, arriving November 19, and November 20 embarked on the transport *Logan*, which arrived at Manila January 5, 1900.

Forty-second Volunteer Infantry.—Organized at Fort Niagara, N. Y., left October 30, 1899, for San Francisco, arriving November 7; embarked November 30 on the transports *Columbia* and *Vostock*, arriving at Manila December 31, 1900.

Forty-third Volunteer Infantry.—Organized at Fort Ethan Allen, Vt., except two companies—L and M—which were raised in California. The ten companies at Fort Ethan Allen left for New York City November 13, 1899, arriving November 14; embarked November 16 on the transport *Meade*, arriving at Manila December 31. The two California companies embarked at San Francisco November 20, and arrived at Manila December 7, 1899.

Forty-fourth Volunteer Infantry.—Organized at Fort Leavenworth, Kans., which post it left October 25, 1899, for San Francisco, arriving October 30; embarked November 20 on the transports *Hancock* and *City of Puebla*, and reached Manila December 19, 1899.

Forty-fifth Volunteer Infantry.—Organized at Fort Snelling, Minn., except two companies—L and M—which were organized at Vancouver Barracks, Wash. The ten companies at Fort Snelling left for San Francisco October 22, 1899, arriving October 27; embarked November 16 on the transports *Senator* and *Benmohr*, and arrived at Manila

December 21; the two companies at Vancouver Barracks embarked at Portland, Oreg., on the transport *Olympia*, November 3, and arrived at Manila December 7, 1899.

Forty-sixth Volunteer Infantry.—Organized at South Framingham, Mass. Left October 16, 1899, for San Francisco, and arrived October 27; embarked November 14 on the transports *Pathan* and *City of Sidney*, arriving at Manila December 14, 1899.

Forty-seventh Volunteer Infantry.—Organized at Camp Meade, Pa. Left November 2, 1899, for New York City, arriving November 3; embarked November 4 on the transport *Thomas*, and arrived at Manila December 22, 1899.

Forty-eighth Volunteer Infantry (colored).—Organized at Fort Thomas, Ky. Left for Angel Island, Cal., November 7, 1899, and arrived November 16; embarked December 21 on the transport *Grant* and reached Manila January 25, 1900.

Forty-ninth Volunteer Infantry (colored).—Organized at Jefferson Barracks, Mo., left November 15, 1899, and arrived at San Francisco, November 23; embarked December 2-6 on the transports *Warren* and *Sherman*, arriving at Manila, January 2, 1900.

Porto Rico Regiment of Infantry.—Section 37 of the act of February 2, 1901, authorized the President to organize and maintain a provisional regiment of infantry for service in the island of Porto Rico, to be composed as far as practicable of natives of that island.

Accordingly, the President ordered the retention of the existing Porto Rico Regiment and its reorganization as a provisional regiment of two battalions of four companies each. The commissioned officers of the old regiment were ordered mustered out June 30, 1901, and the officers of the provisional regiment appointed July 1, 1901, for a period of three years unless sooner discharged. These officers were mostly those having already done service in this battalion. The enlisted men who had become disqualified for service and those who were acceptable and desired to reenlist in the new organization were ordered to be discharged "by authority of the Secretary of War, their services being no longer required."

The general orders governing the muster-out of the United States Volunteers will be found in the appendix.

MILITARY GEOGRAPHICAL DEPARTMENTS.

Since the date of last report the following changes have been made, viz:

The *Division of Cuba* and the *Department of Eastern and of Western Cuba* were discontinued November 15, 1900.

The *Department of Alaska* was discontinued September 30, 1900, and the Territory of Alaska was included in the Department of the Columbia.

Civil government having been established in the island of Porto Rico, the department of that name was discontinued December 15, 1900, and that island was included in the Department of the East.

The present territorial limits of the military geographical departments are as follows:

Division of the Philippines.—Consisting of the departments of Northern Luzon, Southern Luzon, Visayas, and Mindanao and Jolo.

Department of Northern Luzon.—Includes all that part of the island of Luzon north of Laguna de Bay and the province of Laguna, the same being the provinces of Abra, Bontoc, Benguet, Bataan, Bulacan, Cagayan, Ilocos Norte, Infanta, Morong, Ilocos Sur, La Isabela de Luzon, Lepanto, La Union, Nueva Viscaya, Nueva Ecija, all that portion of Manila north of the Pasig River, Principe, Pangasinan, Pampanga, Tarlac, and Zambales, and all the islands in the Philippine Archipelago north of Manila Bay and the provinces above named.

Department of Southern Luzon.—Includes all the remaining part of the island of Luzon, the same including the following provinces: Allay, Batangas, Camarines Norte, Camarines Sur, Cavite, La Laguna, Manila south of the Pasig, and Tayabas, and all the islands of the Philippine Archipelago which lie south of the south line of the Department of Northern Luzon, as above described, including the island of Polillo, and north of a line passing southeastwardly through West Pass of Apo to the twelfth parallel of north latitude; thence easterly along said parallel to 124° 10' east of Greenwich, but including the entire island of Masbate; thence northerly through San Bernardino Straits.

Department of the Visayas.—Includes all islands south of the southern line of the Department of Southern Luzon and east of longitude 121° 45' east of Greenwich and north of the ninth parallel of latitude, excepting the island of Mindanao, and all islands east of the Straits of Surigao.

Department of Mindanao and Jolo.—Includes all the remaining islands of the Philippine Archipelago.

Department of California.—States of California and Nevada, the Hawaiian Islands and their dependencies.

Department of the Columbia.—States of Washington, Oregon, Idaho (except so much of the latter as is embraced in the Yellowstone National Park), and the Territory of Alaska.

Department of the Colorado.—States of Wyoming (except so much thereof as is embraced in the Yellowstone National Park), Colorado, and Utah, and the Territories of Arizona and New Mexico.

Department of Cuba.—Consisting of the island of Cuba.

Department of Dakota.—States of Minnesota, North Dakota, South Dakota, Montana, and so much of Wyoming and Idaho as is not embraced in the Yellowstone National Park.

Department of the East.—New England States, New York, New Jersey, Pennsylvania, Delaware, Maryland, District of Columbia, West Virginia, Virginia, North Carolina, South Carolina, Georgia, Florida, Alabama, Mississippi, Louisiana, the island of Porto Rico, and the islands and keys adjacent thereto.

Department of the Lakes.—States of Wisconsin, Michigan, Illinois, Indiana, Ohio, Kentucky, and Tennessee.

Department of the Missouri.—States of Iowa, Nebraska, Missouri, Kansas, and Arkansas, the Indian Territory, and the Territory of Oklahoma.

Department of Texas.—State of Texas.

MOVEMENT OF TROOPS.

The following is a summary of the movements of troops from and to extraterritorial stations since October 1, 1900:

CUBA.

1901.

February 12.—Companies A, B, C, and D, Tenth Infantry, sailed from Santiago, Cuba, for the United States on transport *Rawlins*. Lieut. Col. S. H. Lincoln, commanding.

February 25.—Headquarters and Companies E, F, G, and H, Tenth Infantry, sailed from Cienfuegos, Cuba, on transport *Sedgwick* for Newport News, Va.

PORTO RICO.

November 14.—Batteries L and O, Fifth Artillery, sailed from New York for Porto Rico. Commander not reported.

November 22.—Transport *McClellan* sailed from San Juan, P. R., with Batteries E and G, Fifth Artillery, and one company Eleventh Infantry, for the United States. Commander not reported.

November 29.—Transport *Crook*, with Troops E and G, Fifth Cavalry, sailed from San Juan, P. R., for United States. Commander not reported.

November 30.—Transport *Rawlins* sailed from Porto Rico for United States with headquarters and Companies K, L, and M, Eleventh Infantry. Col. I. D. De Russy, commanding.

December 3.—Battery G, Fifth Artillery, arrived at Fort Wadsworth, N. Y., from Porto Rico. Second Lieut. J. T. Geary, commanding.

December 3.—Battery E, Fifth Artillery, arrived at Fort Hancock, N. J., from Porto Rico. Second Lieut. M. M. Mills, commanding.

December 3.—Company I, Eleventh Infantry, arrived at Washington Barracks, D. C., from Porto Rico. First Lieut. S. T. Ansell, commanding.

December 6.—Troops E and G, Fifth Cavalry, arrived at Fort Ethan Allen, Vt., from Porto Rico. First Lieut. J. E. Cusack, commanding.

December 6.—Headquarters and Company M, Eleventh Infantry, arrived at Washington Barracks, D. C., from Porto Rico. Col. I. D. De Russy, commanding.

December 7.—Companies K and L, Eleventh Infantry, arrived at Fort McPherson, Ga., from Porto Rico. Maj. J. E. Macklin, commanding.

December 15.—Transport *Crook*, with Brig. Gen. G. W. Davis and Troops F and H, Fifth Cavalry, sailed from San Juan, P. R., for Newport News, Va.

1901.

February 25.—Battalion Porto Rico Regiment and detachment Signal Corps sailed from San Juan, P. R., en route to Washington, D. C.; 11 officers and 284 men. Maj. W. E. Almy, commanding.

March 1.—Companies A, B, C, and D, and band, Porto Rico Regiment, arrived at Newport News, Va., from Porto Rico, en route to Washington, D. C. Maj. W. E. Almy, commanding.

PHILIPPINE ISLANDS.

1900.

October 1.—Transport *Hancock* sailed from San Francisco for Manila with Companies B, D, and M, Twenty-fourth Infantry, and A, C, D, and G, Twenty-fifth Infantry. Total, 15 officers and 903 men; also 3 officers and 100 men, Marine Corps. Maj. J. C. Dent, Twenty-fourth Infantry, commanding.

October 1.—Transport *Logan* arrived at Manila from San Francisco with First and Second Battalions, First Infantry, and Third Battalion, Second Infantry. Total, 41 officers and 1,625 men. Col. A. A. Harbach, First Infantry, commanding.

October 4.—Transport *Strathgyle* arrived at Manila with 2 officers and 79 men, Ninth Cavalry, with horses and mules. Lieut. C. E. Stodter, Ninth Cavalry, commanding.

October 8.—Transport *Rosecrans* arrived at Manila with Batteries C and M, Seventh Artillery, Hospital Corps men and recruits. Total, 7 officers and 534 men. Maj. G. G. Greenough, Seventh Artillery, commanding.

October 10.—Transport *Leelanaw* sailed from San Francisco for Manila with 4 enlisted men and a number of civilian employees and mules. Maj. Thos. Cruise, Quartermaster, commanding.

October 13.—Transport *Wyfield* sailed from San Francisco for Manila with 25 civilian employees and 135 mules. Quartermaster agent in charge.

October 15.—Transport *Frederica* arrived at Manila with detachment Seventh Artillery. Total, 3 officers and 36 men. Lieut. L. C. Berry, Seventh Artillery, commanding.

October 16.—Transport *Grant* sailed from San Francisco for Manila with 6 officers and 615 recruits; also 2 officers and 1 man, Marine Corps. Capt. E. DuBois, Forty-second Infantry, commanding.

October 18.—Transport *Conemaugh* sailed from San Francisco for Manila with 1 officer, 1 Hospital Corps man, 102 horses, 180 mules, and 36 civilian employees. First Lieut. P. L. Smith, Thirty-ninth Infantry, commanding.

October 24.—Transport *Thomas* arrived at Manila with First Battalion, Fifteenth Infantry, and Second Battalion, Eighth Infantry, recruits and Hospital Corps men. Total, 30 officers and 1,538 men. Col. Richard Combs, Fifth Infantry, commanding.

October 28.—Transport *Hancock* arrived at Manila with 3 companies, Twenty-fourth Infantry, and 4 companies, Twenty-fifth Infantry, 15 officers and 903 men; also 3 officers and 100 men Marine Corps. Maj. J. C. Dent, Twenty-fourth Infantry, commanding.

November 1.—Transport *Sherman* sailed from San Francisco for Manila with 8 officers and 282 recruits. Capt. D. F. Anglum, Twelfth Infantry, commanding.

November 7.—Transport *Buford* sailed from New York City for Manila with 23 officers and 945 recruits. Col. Jacob Kline, Twenty-first Infantry, commanding.

November 12.—Transport *Grant* arrived at Manila with 6 officers and 615 recruits; also 2 officers and 1 man, Marine Corps. Capt. E. DuBois, Forty-second Infantry, commanding.

November 13.—Sailed on the *Kilpatrick* from New York City for Manila, 22 officers and 930 recruits. Col. Tully McCrea, Sixth Artillery, commanding.

November 16.—Transport *Sheridan* sailed for Manila with 4 officers and 341 recruits, Hospital and Signal Corps men. Maj. C. L. Hodges, Seventeenth Infantry, commanding.

November 21.—Transport *Buford*, with recruits en route to Manila, arrived at Gibraltar. Col. Jacob Kline, Twenty-first Infantry, commanding.

November 25.—Transport *Buford*, from New York, en route to Manila with recruits, Col. Jacob Kline, commanding, arrived at Malta.

November 25.—Transport *Kilpatrick*, from New York, en route to Manila with recruits, Col. Tully McCrea commanding, arrived at Gibraltar.

November 27.—Transport *Conemaugh*, from San Francisco, arrived at Manila with animals. First Lieut. P. L. Smith, Thirty-ninth Infantry, commanding.

November 28.—Transport *Sherman*, from San Francisco, with recruits, Capt. D. F. Anglum, Twelfth Infantry, commanding, arrived at Manila.

November 30.—Transport *Kilpatrick* arrived at Malta en route to Manila.

November 30.—Transport *Buford* arrived at Port Said en route to Manila.

December 1.—Transport *Aztec* sailed from San Francisco for Manila with animals and supplies. First Lieut. J. M. Graham, Nineteenth Infantry, commanding.

December 1.—Transport *Thomas* arrived at San Francisco from Manila. Brig. Gen. J. H. Wilson was a passenger.

December 1.—Transport *Meade* sailed from San Francisco for Manila with 5 officers, 38 Hospital Corps men, 12 casualties, and 182 recruits. Lieut. Col. J. R. Campbell, Thirtieth Infantry, commanding.

December 10.—Transport *Hancock* arrived at San Francisco from Manila with officers, discharged soldiers, prisoners, etc.

December 13.—Transport *Roscerans* arrived at Manila from China with headquarters and First Battalion Fifteenth Infantry, Col. E. Moale, commanding.

December 15.—Transport *Buford*, from New York en route to Manila, arrived at Colombo, Col. J. Kline, commanding.

December 15.—Transport *Logan* sailed from San Francisco, Cal., with 3 officers and 126 recruits, etc., Capt. W. H. Cowles, Fourth Infantry, commanding.

December 15.—Transport *Thomas* sailed from San Francisco, Cal., with 4 officers, 1 acting assistant surgeon, 1 enlisted man, and 2 civilian employees.

December 15.—Transport *Sheridan* arrived at Manila with 4 officers, 341 recruits, etc., Maj. C. L. Hodges, Seventeenth Infantry, commanding.

December 29.—Transport *Buford* arrived at Manila from New York with 23 officers and 944 recruits, Col. Jacob Kline, Twenty-first Infantry, commanding.

December 31.—Transport *Grant* arrived at San Francisco from Manila.

1901.

January 1.—Transport *Hancock* sailed from San Francisco with Gen. G. W. Davis and aid de camp, 2 Signal Corps men, 14 casuals, and 70 recruits; also 3 officers and 57 men of the Marine Corps.

January 1.—Transport *Thyra* sailed from Portland, Oreg., for Manila with 1 officer, 1 enlisted man, 57 civilian employees, and quartermaster stores; Capt. W. H. Gordon, Eighteenth Infantry, commanding.

January 4.—Transport *Kilpatrick* arrived at Manila from New York with 22 officers and 930 recruits, Col. Tully McCrea, Sixth Artillery, commanding.

January 10.—Transport *Sheridan* sailed from Manila for San Francisco with 27 officers and 654 men, Thirty-seventh U. S. Volunteer Infantry.

January 10.—Transport *Logan* arrived at Manila from San Francisco with 3 officers and 126 enlisted men.

January 16.—Transport *Grant* sailed from San Francisco for Manila with 15 acting assistant surgeons and 106 enlisted men of the Hospital Corps, Signal Corps, casuals, etc., Capt. J. M. Baker, assistant quartermaster, commanding.

January 27.—Transport *Hancock* arrived at Manila with 3 officers and 86 enlisted men; also 3 officers and 57 men of the Marine Corps; Gen. G. W. Davis on board.

January 28.—Transport *Pennsylvania* sailed from Manila for San Francisco with Thirty-sixth Infantry, U. S. Volunteers, 15 officers and 487 enlisted men.

February 1.—Transport *Lawton* sailed from San Francisco for Manila with 2 officers, 14 acting assistant surgeons, and 41 enlisted men.

February 2.—Transport *Meade* sailed from Manila for San Francisco with Eleventh Cavalry, U. S. Volunteers, 24 officers and 562 enlisted men.

February 2.—Transport *Warren* arrived at San Francisco from Manila with 6 officers, number of sick discharged soldiers, etc.

February 6.—Transport *Sheridan* arrived at San Francisco from Manila with Twenty-seventh Infantry, U. S. Volunteers, 27 officers and 641 enlisted men; also other officers, sick and discharged men.

February 10.—Transport *Buford* sailed from Manila for San Francisco with Twenty-seventh Infantry, U. S. Volunteers, 28 officers and 853 men.

February 12.—Transport *Grant* arrived at Manila from San Francisco with 15 acting assistant surgeons, 106 Hospital and Signal corps men and recruits.

February 16.—Transport *Sheridan* sailed from San Francisco for Manila with First battalions Twenty-sixth and Twenty-seventh U. S. Infantry, and detachment of recruits; total, 9 officers and 1,358 men, Capt. J. H. H. Peshine, Thirteenth Infantry, commanding.

February 17.—Transport *Hancock* sailed from Manila for San Francisco with Thirtieth Infantry, U. S. Volunteers, 26 officers and 751 enlisted men.

February 17.—Transport *Kilpatrick* sailed from Manila for San Francisco with 400 sick.

February 27.—Transport *Indiana* arrived at San Francisco from Manila with sick and discharged men.

March 1.—Transport *Meade* arrived at San Francisco from Manila with Eleventh Cavalry, U. S. Volunteers, detachments, sick, etc.; total, 32 officers and 747 men.

March 1.—Transport *Logan* sailed from Manila with Generals Young and Hare, and Thirty-third and Thirty-fourth Infantry, U. S. Volunteers; total, 48 officers and 1,554 men.

March 2.—Transport *Pennsylvania* arrived at San Francisco from Manila with Thirty-sixth Infantry, U. S. Volunteers; 15 officers and 500 men.

March 9.—Transport *Garrone*, with 49 officers and 849 men, Twenty-sixth Infantry, U. S. Volunteers, sailed from Manila for San Francisco, Cal.

March 12.—Transport *Hancock* arrived at San Francisco, Cal., from Manila with Thirtieth Infantry, U. S. Volunteers, and small detachment; total, 30 officers and 826 men.

March 13.—Transport *Buford* arrived at San Francisco from Manila with Twenty-seventh Infantry, U. S. Volunteers, and detachments; total, 28 officers and 861 men.

March 15.—Company D, Tenth Infantry, and Companies A, B, C, and D, Twenty-eighth Infantry, U. S. Volunteers, and detachment of Hospital and Signal Corps men sailed on transport *Indiana* from San Francisco, Cal., for Manila; total, 6 officers and 740 men, Maj. R. T. Yeatman, Twenty-second Infantry, commanding.

March 16.—Transports *Thomas* and *Rosecrans*, with Twenty-eighth and Thirty-fifth Infantry, U. S. Volunteers, 66 officers and 1,846 men, and the transport *Lawton*, with the Twenty-ninth Infantry, U. S. Volunteers, 27 officers and 668 men, sailed from Manila for San Francisco, Cal.

March 17.—Transport *Kilpatrick* arrived at San Francisco, Cal., with sick officers and men and discharged soldiers.

March 18.—Transport *Meade* sailed from San Francisco for Manila with General Wade and Young, headquarters A, B, C, D, I, K, L, and M, Fifth, and A and B Fifteenth Cavalry; total, 26 officers and 840 men.

March 18.—Transport *Pennsylvania* sailed from San Francisco for Manila with Companies B, C, I, K, L, and M, Tenth Infantry; total, 17 officers and 885 men.

March 20.—Transport *Pokling* sailed from San Francisco for Manila with animals, etc., 2 officers and 107 enlisted men.

March 23.—Transport *Grant* sailed from Manila for San Francisco with Twenty-ninth and Thirty-third Infantry, U. S. Volunteers, and one company Twenty-sixth Infantry.

March 25.—Transport *Hancock* sailed from San Francisco for Manila with E, F, G, and H, Sixth Cavalry, and C, D, H, and M, Seventh Infantry; total, 22 officers and 889 enlisted men; Lieut. Col. L. H. Rucker, Sixth Cavalry, commanding.

March 28.—Transport *Weyfield* arrived at Manila with quartermaster stores.

March 29.—Transport *Logan* arrived at San Francisco from Manila with Thirty-third and Thirty-fourth Infantry, U. S. Volunteers; 58 officers and 1,566 enlisted men.

March 31.—Transport *Arab* sailed from San Francisco for Manila with animals and 2 officers and 78 men; First Lieut. J. C. Raymond, Sixth Cavalry, commanding.

April 1.—Transport *Buford* sailed from San Francisco for Manila with C and D, Fifteenth Cavalry, and E, F, G, and H, Fifth Infantry; 12 officers and 898 enlisted men; Lieut. Col. A. H. Bowman, Fifth Infantry, commanding.

April 5.—Transport *Kilpatrick* sailed from San Francisco for Manila with headquarters, and I and M, Eleventh Infantry, K and L, First Infantry, G, Fifteenth Cavalry, and A, Tenth Infantry; total, 18 officers and 844 enlisted men; Col. I. D. De Russy, Eleventh Infantry, commanding.

April 6.—Transport *Aztec* sailed from San Francisco for Manila with 2 officers, 1 enlisted man, and horses and mules.

April 14.—Transport *Thomas* arrived at San Francisco from Manila with Twenty-eighth Infantry, U. S. Volunteers, and First and Third Battalions, Thirty-fifth Infantry, U. S. Volunteers.

April 15.—Transport *Indiana* arrived at Manila, P. I., from San Francisco, with D, Tenth Infantry, and A, B, C, and D, Twenty-eighth Infantry.

April 15.—Transport *Logan* left San Francisco for Manila with I, K, L, and M, Ninth Cavalry, E, F, G, and H, Tenth Cavalry, and A, B, C, and D, Eleventh Infantry; total, 28 officers and 1,486 enlisted men.

April 16.—Transport *Ohio* sailed for Manila with Companies A, B, C, and D, Thirtieth Infantry; total, 9 officers and 703 men; Lieut. Col. L. A. Matile, Fifteenth Infantry, commanding.

April 16.—Transport *Thyra* sailed for Manila with 2 officers, 53 men, and 545 horses.

April 17.—Transport *Launton* arrived at San Francisco, Cal., from Manila, with Thirty-ninth U. S. Volunteer Infantry.

April 18.—Transport *Rowerans* arrived at San Francisco from Manila with Second Battalion, Thirty-fifth U. S. Volunteer Infantry.

April 19.—Transport *Grant* arrived at San Francisco from Manila with Company F, Twenty-sixth Infantry, and entire Thirty-second U. S. Volunteer Infantry.

April 20.—Transport *Garrone* arrived at San Francisco with eleven companies, Twenty-sixth U. S. Volunteer Infantry.

April 20.—Transport *Thomas* sailed from San Francisco for Manila with 4 officers and 157 recruits, etc.; also 6 officers and 150 men, Marine Corps.

April 22.—Transport *Sheridan* sailed from Manila for San Francisco with Generals Bates and Grant and Forty-fifth and Forty-sixth U. S. Volunteer Infantry.

April 26.—Transport *Grant* sailed from San Francisco for Manila with 9 officers and 24 men.

May 2.—Transport *Buford* arrived at Manila from San Francisco with Troop D, Fifteenth Cavalry, and Companies E, F, G, and H, Fifth Infantry.

May 10.—Transport *Ohio* arrived at Manila from San Francisco with Companies A, B, C, and D, Thirtieth Infantry.

May 12.—Transport *Kilpatrick* arrived at Manila from San Francisco with Troop G, Fifteenth Cavalry, Companies K and L, First Infantry, A, Tenth Infantry, and I and M, Eleventh Infantry.

May 14.—Transport *Logan* arrived at Manila from San Francisco with Troops I, K, L, and M, Ninth Cavalry, and E, F, G, and H, Tenth Cavalry, and Companies I and M, First Infantry, and A, B, C, and D, Eleventh Infantry.

May 17.—Transport *Sheridan* arrived at San Francisco from Manila with Forty-fifth Infantry, U. S. Volunteers, and Forty-sixth Infantry, U. S. Volunteers; also Generals Bates and Grant.

May 18.—Transports *Hancock*, *Buford*, and *Aztec* sailed from Manila for San Fran-

cisco with Thirty-first and Forty-first, and Company H, Forty-second Infantry, U. S. Volunteers.

May 20.—Transport *Thomas* arrived at Manila from San Francisco with detachment of recruits, etc.

May 22.—Transport *Pennsylvania* sailed from Manila for San Francisco with Fortieth Infantry, U. S. Volunteers.

May 23.—Transport *Grant* arrived at Manila from San Francisco with 9 officers and 24 men, Hospital Corps.

May 25.—Transport *Lawton* sailed from San Francisco for Manila with Companies K and L, Eleventh Infantry, Maj. J. E. Macklin commanding.

May 26.—Transport *Kinduck* sailed from Manila for Portland, Oreg., with Company B, Forty-second Infantry, U. S. Volunteers.

May 27.—Transport *Thomas* sailed from Manila for San Francisco with Forty-seventh and Forty-ninth and three companies Thirty-eighth Infantry, U. S. Volunteers.

May 29.—Transport *Ohio* sailed from Manila for San Francisco with ten companies Forty-second Infantry, U. S. Volunteers.

May 31.—Transport *Logan* sailed from Manila for San Francisco with Second Battalion, Thirty-eighth Infantry and the Forty-fourth Infantry U. S. Volunteers.

June 1.—Transport *Sheridan* sailed from San Francisco for Manila with 17 officers and 249 enlisted men, recruits, etc.

June 1.—Transport *Thyra* sailed from Manila with Company B, Thirtieth Infantry, U. S. Volunteers.

June 2.—Transport *Grant* sailed from Aparri, P. I., for San Francisco, Cal., with the Forty-eighth and two battalions of the Forty-ninth Infantry, U. S. Volunteers.

June 6.—Transport *Kilpatrick* sailed from Manila for San Francisco, Cal., with Forty-third Infantry, U. S. Volunteers.

June 6.—Transport *Pakling* sailed from Manila for the United States with Tenth Field Battery, Artillery Corps.

June 9.—Transport *Hancock* arrived at San Francisco from Manila with Thirty-first Infantry, U. S. Volunteers.

June 19.—Transport *Aztec* arrived at San Francisco, Cal., with Company H, Forty-second Infantry, U. S. Volunteers.

June 20.—Transport *Indiana* sailed from Manila for San Francisco with the First Field Battery and the Twenty-ninth, Thirtieth, Thirty-second, and Thirty-third companies, Coast Artillery.

June 21.—Transport *Ohio* arrived at San Francisco from Manila with headquarters and 10 companies Forty-second Infantry, U. S. Volunteers.

June 23.—Transport *Lawton* arrived at Manila from San Francisco with detachment of Signal Corps and Hospital Corps men.

June 24.—Transport *Grant* arrived at San Francisco from Manila with Forty-eighth Infantry, U. S. Volunteers, and headquarters and 8 companies Forty-ninth Infantry, U. S. Volunteers.

June 25.—Transport *Logan* arrived at San Francisco from Manila with Forty-fourth Infantry, U. S. Volunteers, and Second and Third battalions Thirty-eighth Infantry, U. S. Volunteers.

June 25.—Transport *Hancock* sailed from San Francisco for Manila with Generals Corbin, Weston, and Sternberg, and other officers; also Second Battalion of Engineers.

June 26.—Transport *Buford* arrived at San Francisco from Manila with Forty-first Infantry, U. S. Volunteers.

June 26.—Transport *Thomas* arrived at San Francisco from Manila with Forty-seventh Infantry, U. S. Volunteers; 3 companies Thirty-eighth Infantry, U. S. Volunteers, and 4 companies Forty-ninth Infantry, U. S. Volunteers.

June 28.—Transport *Sheridan* arrived at Manila from San Francisco with 17 officers and 249 enlisted men.

June 29.—Transport *Pakling* arrived at San Francisco from Manila with the Tenth Field Battery.

July 4.—Transport *Meade* sailed from Manila for San Francisco with the Eighth Field Battery.

July 10.—Transport *McClellan* sailed from New York for Manila with 6 officers and 94 enlisted men.

July 15.—Transport *Sumner* sailed from Manila for San Francisco, Cal., with sick.

July 16.—Transport *Grant* sailed from San Francisco for Manila with General Ludington, 26 other officers, and 49 recruits.

July 16.—Transport *Indiana* arrived at San Francisco from Manila with the Twenty-ninth, Thirtieth, Thirty-second, and Thirty-third Companies Coast Artillery, and the First Field Battery.

July 20.—Transport *Sheridan* sailed from Manila for San Francisco with Company A, Engineers, and headquarters and 8 companies Fourteenth Infantry.

July 23.—Transport *Thomas* sailed from San Francisco for Manila with 1 officer, 4 contract nurses, and 1 hospital corps man.

July 28.—Transport *Meade* arrived at San Francisco from Manila with Eighth Field Battery, and sick and discharged soldiers.

August 1.—Transport *Kilpatrick* sailed from San Francisco for Manila with 13 officers and 97 recruits, etc.

August 5.—Transport *Hancock*, with 11 troops Fourth Cavalry, sailed from Manila for San Francisco.

August 11.—Transport *Sumner* arrived at San Francisco from Manila with sick discharged soldiers, etc.

August 16.—Transport *Meade* sailed from San Francisco for Manila with General Breckinridge, 7 other officers, and 102 recruits.

August 18.—Transport *Sheridan* arrived at San Francisco from Manila Company A, Engineers, headquarters Second and Third Battalions, Fourteenth Infantry.

August 21.—Transport *Thomas* arrived at Manila from San Francisco.

August 22.—Transport *Ingalls* sailed from New York for Manila with 4 officers and 26 enlisted men.

August 25.—Transport *Grant*, with Troop B, Fourth Cavalry, and Twelfth and Thirteenth Field Batteries, sailed from Manila for San Francisco.

August 28.—Transport *Hancock* arrived at San Francisco from Manila with 11 troops Fourth Cavalry.

August 31.—Transport *Sheridan* sailed from San Francisco for Manila with General Grant and 13 other officers.

September 5.—Transport *Dix* arrived at San Francisco, Cal., from Manila with the remains of 300 deceased soldiers.

September 12.—Transport *Sumner* sailed from San Francisco for Manila with 5 officers and 2 hospital corps men.

September 16.—Transport *Warren* sailed from San Francisco for Manila with 9 officers.

September 16.—Transport *Kilpatrick* sailed from Iloilo, P. I., for San Francisco with headquarters and 8 companies Eighteenth Infantry, 27 officers, and 896 enlisted men.

September 18.—Transport *Grant* arrived at San Francisco from Manila with Troop B, Fourth Cavalry, and Twelfth and Thirteenth Batteries, Field Artillery.

CHINA.

1900.

November 1.—Headquarters and eight companies Fourteenth Infantry sailed from China for Manila. Commander not reported.

November 7.—One troop Sixth Cavalry sailed from China for Manila. Commander not reported.

November 8.—Two troops, Sixth Cavalry, and four batteries, Third Artillery, sailed from China for Manila. Commander not reported.

December 2.—Headquarters and First Battalion Fifteenth Infantry sailed from China for Manila. Col. E. Moale commanding.

1901.

April 9.—Transport *Egbert* sailed from Taku, China, for San Francisco, Cal., with 3 officers, guards, prisoners, discharged soldiers, and remains of deceased officers and soldiers.

May 27.—Transports *Sumner* and *Lennox* sailed from Taku for Manila, with Troops I, K, L, and M, Sixth Cavalry, Tenth Field Battery, Artillery Corps, and all of the Ninth Infantry, excepting Company B (150 strong), which was selected as the legation guard.

THE MILITARY ACADEMY.

Special attention is invited to the remarks of Colonel Mills, the superintendent, upon the improved discipline and general excellent condition of the Corps of Cadets. It is safe to predict that hazing, of a brutal or objective nature, is a thing of the past, and that it will not soon again be a subject for consideration by the War Department. All in all, it is believed by those most competent to speak that the

Academy is in a better condition of discipline and in everything that relates to its success to-day than at any time in its history.

Colonel Mills's recommendations that—

To make the hospital service perfect, a detached building for the isolation and treatment of cases of infectious diseases is necessary, and should be furnished. Should such diseases break out when cadets are in barracks there exists no sufficient means for properly isolating such cases if in a considerable number.

An electric lighting plant needed; the present gas plant is taxed to its capacity, and when buildings under construction are completed, it is not believed it will be capable of sufficient enlargement to meet the demands that will be made upon it.

To further improve and broaden the education given at the Academy the superintendent renews his recommendations of last year for a small appropriation for the purpose of establishing a course of lectures on timely topics by capable speakers from civil life.

It is imperative that additional barrack-room for cadets be provided, in order to meet the demands of study and give to each the air space health requires. Other buildings, also necessary for their training, must be enlarged. This matter was made the subject of a separate report last year, showing in detail the necessity existing in each case.

The most urgent necessity exists for sufficient appropriation for additional quarters for officers, and for the construction of a carriage road from the south dock to the south end of the reservation.

Attention is called to the West Point Hotel, with the recommendation that Congress be urged to appropriate sufficient funds to renovate it. If Congress is unwilling to do so, it is recommended that the right to renovate and reconstruct the building be given to civilians on terms which will be to the advantage both to the Government and to them. This is one of the most urgent needs of the Academy,

are commended to your most favorable action.

The cost of installing a modern seacoast battery being too great to warrant the expenditure at this time, the cadets of each graduating class should be sent to Fort Monroe for practice and instruction in seacoast gunnery, and a thorough post-graduate course therein. This could be done at little expense and with far better results than could be obtained with a single battery, which, as has been stated, can only be erected at great expense, and for this reason is not urgently recommended.

MILITARY INFORMATION DIVISION.

On November 17, 1900, Capt. Eaton A. Edwards, Twenty-fifth Infantry, was detailed for duty in the division.

Capt. Joseph C. Castner, Fourth Infantry, was relieved from duty in the division on March 30, 1901.

Lieut. (now Capt.) Winfield Scott Overton, Artillery Corps, and Lieut. Joseph S. Herron, Eighth Cavalry, have remained on duty in the division during the fiscal year. Captain Overton is now under orders to join his battery.

Lieut. Harley B. Ferguson, Corps of Engineers, was detailed for duty in the division on August 30, 1901.

Capt. Edwin A. Root, Tenth Infantry, was relieved from duty in the division on September 6, 1901.

All the military technical publications, dispatches, reports, etc., received in the division from our military attachés and other sources abroad, have been noted, carded, and properly classified.

Many communications addressed to the War Department or its bureaus and written in foreign languages have been translated in the division.

A considerable amount of data on various military subjects has been furnished from time to time to the different bureaus of the War

Department, officers of the Army, and service schools, in addition to that published in the several pamphlets prepared in the division.

Capt. Carl Reichmann, Seventeenth Infantry, and Capt. Stephen L'H. Slocum, Eighth Cavalry, who accompanied the Boer and British forces in South Africa, respectively, have submitted their final reports on the military operations in South Africa. Extracts from these reports have been published in Military Information Division Publication, No. XXXIII.

Since the last annual report the military information division has prepared and issued the following-described publications:

"Military Notes on the Philippines" (illustrated)—an additional supply of 500 copies.

"List of military publications, books, pamphlets, etc., received in the Adjutant-General's Office, War Department, from August 1 to November 1, 1900."

Same from November 1, 1900, to April 1, 1901.

Same from April 1, 1901, to September 1, 1901.

No. 31. "Explorations in Alaska, 1899, for an all-American overland route from Cook Inlet, Pacific Ocean, to the Yukon," by First Lieut. Joseph S. Herron, Eighth Cavalry.

No. 32. "Notes of military interest for 1900."

No. 33. "Reports on military operations in South Africa and China."

WORK OF THE MAP SECTION DURING THE YEAR.

New edition (1901) of the "Carta General del Archipelago Filipino" (published).

New edition (1901) of the "Military map of the isle of Luzon" (published).

Map showing stations occupied by the United States Army.

This work has all been of the most satisfactory character. Especially have the maps of China been of very great value to our troops operating in that country, and have been highly complimented by all interested in them.

One hundred and seventy tracings have been made for the Annual Report of the Lieutenant-General Commanding the Army and the various publications of this office.

Eight hundred and thirty-eight maps, both foreign and domestic, have been received and filed.

WORK OF THE PHOTOGRAPHIC ROOMS DURING THE FISCAL YEAR.

There have been in the photographic rooms over 500 negatives on wet plates varying in size from 5 by 7 inches to 34 by 34 inches, and a somewhat greater number of negatives on dry plates varying in size from 4 by 5 inches to 17 by 20 inches.

The wet-plate negatives have been principally copies and enlargements of line work, such as of maps and official documents. In the cases of the map work, much of it has been to photograph to the same scale sets of maps of the same region drawn on different scales, each map of a set containing some desirable information not found on the others of the set, and then supplying prints from the negatives for the use of the draftsmen in the military information division for them to use in compiling a new map containing all the information on all the separate maps of the set.

Such was the method used in compiling the complete maps of Cuba, Porto Rico, the Philippine Islands, South Africa, and China.

By this method a great saving is made in both time and money in the compilations of maps in the military information division, besides producing them on the new scale with all the accuracy of the originals, since by photography the work of enlarging and reducing is done in a

very short space of time and with comparatively small expense, which if done by the most rapid and improved methods by the draftsmen, would, in some cases, require months of steady work, with all the chances of various errors creeping in.

During the sessions of Congress, when the War Department was called upon to furnish copies of important and sometimes secret letters and documents, etc., to the committees and members, these papers were sent over to the gallery to be photographed and facsimile copies of them made, which were furnished, and they answered all the purposes for which they were required, and the necessity for taking the originals from the files and letting them pass out of the possession of the Department and running the risk of losing them was thus avoided.

Most of the dry-plate work has consisted in copying photographs accompanying the various reports received from different officers during the year and preparing special prints of them for the use of the photo-engravers in making half-tone plates to reproduce the photographs in the published reports.

Other dry-plate work has been in the copying of pictures for the war album, and of illustrations for the publications of the military information division.

Considerable orthochromatic work has been done in copying colored maps and blue prints, which could not have been done on either wet plates or ordinary dry plates.

There have been made during the year nearly 5,000 prints on the various kinds of paper, depending upon the purpose the print was to serve. Most have been prints direct from the negatives, although many enlargements on bromide paper have been made, some as large as 3½ feet wide by 7 feet long.

The work on the war album has progressed, and the preparation of new views to be included in it has been continued with all the rapidity possible in the time when not otherwise engaged in the regular map and other work of the division.

Through the kindness of Mr. E. C. Rost, artist and author, of New York City, who loaned the Department nearly 600 glass negatives of scenes in Cuba, taken at the time of the occupation in 1898 and 1899, there have been made prints from about 175 of these negatives, to be included in the album.

In the military information division exhibit at the Pan-American Exposition the photographic rooms furnished as a sample of their work four large prints of maps representing explorations by the Army in Alaska. The negatives from which these prints were taken were some made in the course of the regular work for the division, and not for this special exhibition; nevertheless they were thought to be as good as could be made by anyone anywhere with especial care for exhibition purposes, hence they were used. This is mentioned simply to illustrate the care that is always used to produce the best work possible at all times.

No additional apparatus has been added to the gallery during the year, the only expense having been for materials and chemicals used in the regular work. Until more suitable and commodious quarters can be obtained for the gallery, there is in it now about all that can be conveniently used.

All old hypo baths after becoming exhausted, the waters in which prints were washed, and all scraps of sensitized paper were carefully

saved and the contained silver recovered and refined, netting 97 ounces of pure nitrate of silver of almost \$50 value, or nearly six months' supply.

MILITARY ATTACHÉS.

The following is a list of the military attachés at American embassies and legations abroad:

EMBASSIES.

London: Capt. Edward B. Cassatt, Thirteenth Cavalry.
 Paris: Capt. T. Bentley Mott, Artillery Corps.
 Berlin: Lieut. Col. John B. Kerr, Ninth Cavalry.
 St. Petersburg: Capt. Stephen L'H. Slocum, Eighth Cavalry.
 City of Mexico: Capt. Powell Clayton, jr., Eleventh Cavalry. (Relieved July 1, 1901.)

LEGATIONS.

Berne: Maj. George R. Cecil, Third Infantry.
 The Hague: Lieut. Col. James N. Wheelan, Seventh Cavalry. (Relieved February 4, 1901.)
 Copenhagen and Stockholm: Lieut. Col. W. R. Livermore, Corps of Engineers.
 Brussels: Lieut. Col. James N. Wheelan, Seventh Cavalry. (Relieved February 4, 1901.)
 Peking: Capt. James H. Reeves, Fourteenth Cavalry.
 Tokyo: Maj. Oliver E. Wood, Artillery Corps.

The proper selection of officers for the important and delicate duty of military attaché to the several embassies and legations is greatly hampered and restricted by the fact that the additional expense to the officer involved by his acceptance of a detail is so burdensome that only those possessing private means can afford to serve in that capacity. In such cases, even, positive injustice is done to the officer having the requisite qualifications and able to accept the position by forcing him to expend his private means in the performance of a public duty.

It is therefore again urged that the attention of Congress be earnestly called to this subject, in order that, by suitable legislation, capable officers may be able to respond, without injustice to themselves, to the call that may be made upon them for special duty abroad. It is recommended that every officer while so serving shall have at least the rank, pay, and allowances of a lieutenant-colonel.

STAFF DETAILS.

Section 26 of the act of February 2, 1901, provides that no more permanent appointments shall be made in the Adjutant-General's Department, the Inspector-General's Department, the Quartermaster's Department, the Subsistence Department, the Ordnance Department, and the Signal Corps after the original vacancies created by the act shall have been filled. Vacancies occurring thereafter, except that of the chief of department or corps, which can not be filled by promotion, shall be filled by details from the line and from the grades in which the vacancies exist; all staff details to be made for a period of four years, at the expiration of which the officer detailed shall return to duty in the line, and, if under the rank of lieutenant-colonel, shall not again be eligible for selection in any staff department until after serving two years with the line.

The method adopted for apportioning the number of details to staff departments and other detached-service of officers of the line is as follows:

The total number of officers in these arms, when completely organized, will be—

Cavalry.....	750
Artillery.....	651
Infantry.....	1,500
Total.....	2,901

The number of places in the Adjutant-General's Department subject to detail is 15 and that in the Inspector-General's Department 8, making a total of 23.

Making details in proportion to the number of officers in each arm, the—

Cavalry should have 5.94, or, in round numbers.....	6
Artillery should have 5.16, or, in round numbers.....	5
Infantry should have 11.89, or, in round numbers.....	12
Total.....	23

The fractions six twenty-thirds for the cavalry, five twenty-thirds for the artillery, and twelve twenty-thirds for the infantry are applicable to all details to staff departments authorized by the act of February 2, 1901.

To insure equal promotion, the above proportions apply to each grade and not to the total number in all staff departments subject to detail. So far the detailed system has fully met the expectations of the Department, and will in time give to the service an additional number of thoroughly trained staff officers acquainted with all the duties of well-equipped officers.

INSTRUCTION OF THE ARMY.

Notwithstanding the enormous amount of time, thought, and labor devoted to the instruction and general training of officers and men of the Army, there is no coherent plan which carries forward the work from one grade to another and connects the valuable work done in the various schools. Now that the reorganization of the Army under the act of February 2, 1901, is about completed, it seems a fit time to devise some scheme setting forth the views of the Department, in order that all officers may familiarize themselves with the full intent as to the course to be pursued in the future. Careful study and consideration of what has been accomplished in the past, and what appears to be desirable for the future, leads to the belief that the system of training for the officers should begin with elementary technical instruction at each post, and terminate in the higher training which would be provided by a War College, the speedy and complete organization of which is most desirable.

To give life to this or any other system, it is essential that a progressive record of work done should be introduced into the scheme. Examination by carefully selected boards, capable of determining an officer's practical and technical ability to perform the duties of his grade, appear to be an essential element in any worthy record system. In this way unusual efficiency would be made known, while at the same time cognizance could be taken of any lack of a reasonable degree of proficiency.

It is regarded as most desirable that officers of the National Guard or militia be authorized to participate in the work of the service schools and the War College to as great an extent as may be possible. It is believed that the details of this scheme can be worked out in such a way as to induce no inconsiderable number of ambitious and able young officers of the State troops to participate sufficiently to familiarize themselves with the work actually done in a well administered army.

Officers who, by their industry, ability, and general intelligence, commend themselves as worthy of special recommendation in the various schools should receive the highest possible consideration of the Department, with a view to utilizing their services as military attachés, instructors in the various schools, and for any service requiring special aptitude.

The services of a number of selected young officers have been availed of from time to time in the military information division of the Adjutant-General's Office, and an immense amount of painstaking and important work has been accomplished. It is proposed to continue to utilize the services of such officers, and the record of established ability heretofore mentioned would enable the Department to make such details with greater assurance of fitting the individual to the particular character of the work desired in that division according to his aptitude and proficiency. Work is already in progress enlarging the facilities of the several service schools, and steps have been taken to transfer to the artillery the school of torpedoes and submarine mines at Fort Totten, heretofore conducted under the Chief of Engineers. The special school for engineers has been removed to Washington Barracks, D. C.

It will take some little time to complete the contemplated improvements at all the posts where the service schools are established and to get them in smooth running order, but this work, under instructions of the Secretary of War, will be pushed forward as rapidly as existing conditions will admit.

INSTRUCTION IN MILITARY SCHOOLS AND COLLEGES.

Especially deserving of consideration in connection with this scheme, or any other which may be adopted, is the proper development of the military instruction of students in the various colleges of the country. The records of these schools show that while a few have developed a military element in a proper and comprehensive way, some have sought the details of army officers partly as advertisement, and that the military portion of the curriculum is so limited as to be of no substantial benefit. Since the Department authorized the detail of retired officers with full pay a number of officers have sought the detail for the material benefit accruing from full pay and allowances over retired pay. It is reported that some of these officers do not even live at the colleges and only occasionally visit them. This is a matter which needs correction, but should not be taken up until the general scheme is developed, so that when undertaken it will be thoroughly done.

PROMOTION OF ENLISTED MEN.

In former years the promotions from the ranks were confined to noncommissioned officers who had shown special abilities for command. A few years ago a bill prepared by the Department passed Congress making the promotion depend upon a general examination

open to all enlisted men of two years' service, regardless as to whether they had shown any special aptitude to command, and in many cases privates have been appointed second lieutenants without having had the opportunity to be properly tested and without experience in command.

Under the act of February 2, 1901, vacancies were filled by men of one year's service, but the old law will obtain as soon as the original vacancies are once filled. The operation of the general law is as follows:

During March of each year an examination board was ordered in each military geographical department for the examination of all candidates who desired to compete for a commission. Those who passed were ordered the following September to Fort Leavenworth, Kansas, where a central board examined all the candidates from the Army and arranged them according to the results of their competitive examination. There was a widespread feeling in the Army, not only among the officers, but among the old and valued noncommissioned officers and soldiers, that this system was not altogether the best method of obtaining officers. Men who were apparently unfit for promotion to the grade of corporal, but who had been brought up where they had had the advantages of good public schools, could, with preparation, qualify for commissions and immediately be promoted and sent back as commissioned officers to command men, when they had failed in the same regiments to obtain a noncommissioned grade by any soldierly ability.

A great many excellent young men have come into the service this way as officers, but a number of others have been commissioned who would not have reached the grade of officer under any system which would take into consideration the future duties of the army officer.

It is recommended that the old law requiring that each candidate should be a "noncommissioned officer in good standing who has displayed an aptitude for command and control of men" be revived; after the annual examination in the geographical departments, those who qualify to be sent to one of the service schools and there put through a course under the instructors—say, for six months—which should take the place of the second examination, and only those who demonstrate the proper qualifications while undergoing this course to be nominated for commissions.

Another proposition suggested commends itself, which is to detail annually one noncommissioned officer, to be selected by a board of officers in each regiment, to represent the regiment at the service schools, and such proportion from the Artillery Corps and other branches having enlisted men as would equal this ratio; that these candidates be put through a course of study at one of the service schools, and all vacancies occurring in the Army during the year, not required for the graduates from the Military Academy, to be filled from this class. Those who failed to secure commissions would be benefited by the course pursued, and would return to their regiments better fitted to perform the duties of the higher noncommissioned grades, and from them the post noncommissioned staff could be obtained.

It is believed that the period of two years is hardly sufficient to determine the qualifications of the average enlisted man for a commission, without some special training where he will be under the observant eyes of officers who fully appreciate that he is a candidate for a commission.

It is believed that our Army is the only one in the world promoting directly from the ranks without some intermediate service as a candidate, either at a school, or as a candidate noncommissioned officer whose actions are closely observed by his superiors with a view to determining his aptitude and fitness.

It is thought that a full enlistment of three years should be required of all candidates for commissions, including service at the school. The average of age enlisted men who appear before the boards is believed to be below that of the graduates of the Military Academy, so that no disadvantage to the candidates would be entailed.

POST EXCHANGES.

During the year ending June 30, 1901, the aggregate receipts of the exchanges in operation in the Army, so far as reports have been received, amounted to \$2,123,077.29, and there was received as money on deposit \$39,744.97, making the total amount of money received \$2,162,822.26. There was expended for merchandise purchased, rents, fixtures, and repairs, and expenses of operation, \$1,586,828.25, which, less deposits, gives a profit of \$536,249.04. From this amount there was donated to the funds of the several regimental bands, \$6,985.02; to the maintenance of post gardens, \$3,293.81; to post libraries, \$1,900.70; to gymnasiums, \$3,727.92; as prizes for the encouragement of athletic sports, \$5,451.19, and, after setting aside the sum of \$192,346.20 as a reserve fund to meet anticipated expenses for at least one month, there was passed to the credit of the companies and mess funds for the benefit of the soldiers, in the form of dividends, the sum of \$322,544.20. The net value of these exchanges—that is to say, the balance of their combined assets over their liabilities, was on June 30, 1901, \$353,748.40. The provision of the act of Congress which prohibits the sale of beer, etc., has been carried into effect.

THE RECRUITING SERVICE.

In October, 1900, the Regular Army closely approximated the authorized maximum of 65,000 enlisted men, and consequently the efforts of the recruiting service during the remainder of the year 1900 were confined to the filling of vacancies as they occurred, and the shipment of recruits to the Philippines to meet vacancies in organizations there up to December 31. With the passage of the act of February 2, 1901, increasing the Regular Army, and to some extent anticipating this action, recruiting officers were incited to renewed activity, and during the months of January and February 13 additional central stations were opened, and an active canvass was entered upon in the vicinity of all regular recruiting stations, with a view to covering as fully as possible with the officers available all parts of the country. The officers for duty at these new stations and others as assistants to the regular recruiting officers were detailed as opportunity offered, selections being made generally from officers who had been invalided home from the Philippines or Cuba and had partially recovered their health. Advantage was taken, later, of the services of a number of officers on duty at the Military Academy, who became available for temporary recruiting duty owing to the advanced graduation of the

first class; and still others were thus utilized during the summer recess at the academy.

Taking the period from October 1, 1900, to October 1, 1901, the smallest number of officers on general recruiting service during any one month was 51; the largest number was 81. In October, 1900, there were 62 central recruiting stations in the larger cities; there are now about 100 of these. In several instances one officer conducts two or more such stations, and many of the recruiting officers stationed in these cities also visit and conduct temporary stations, maintaining them for a longer or shorter term according to their productiveness, thus canvassing the sections surrounding their main stations. The smallest number of cities and towns canvassed during any one month by these general recruiting officers was 92; the largest number 298. Three of the stations opened early in 1901 have been closed.

The efforts of the officers on general recruiting service were supplemented by enlistments at all military posts by officers detailed by the post commanders, and in February, 1901, instructions were given to the department commanders within the United States to expand the post recruiting service to embrace a canvass of surrounding towns by enlisted men, these towns to be visited when necessary by the post recruiting officer and the surgeon, to make examinations and enlistments. The largest number of towns canvassed during any one month by recruiting officers from posts was 50; the largest number of cities and towns visited during any one month by recruiting officers from both city stations and posts was 325; but in addition to these many other towns were visited by enlisted members of recruiting parties, distributing recruiting posters, circulars of information, etc.

NEW REGIMENTS.

With the passage of the act of February 2, 1901, the recruitment of the 10 new regiments authorized by that act, viz, 5 regiments of cavalry and 5 of infantry, was actively entered upon. The recruitment of the infantry regiments was completed by July 6, and of the cavalry regiments by July 20, and this notwithstanding the fact that over 1,700 recruits were diverted from these regiments before their completion to other organizations, to meet certain contingencies of the service.

ARTILLERY.

In order to allow the recruiting of the artillery to proceed as rapidly as possible without prejudice to the early organization of the new infantry and cavalry regiments, provision was made March 27, 1901, for the further extension of the plan of post recruiting to provide for ordering artillery officers, whenever practicable, to visit cities and towns adjacent to their posts to make enlistments for their respective companies. It was designed by this provision to afford every opportunity for artillery officers to accomplish the work of recruiting their own corps.

The early completion of the new regiments being assured, all general recruiting officers were directed, June 4, to give special attention to the enlistment of suitable recruits for the artillery; and July 3, the recruitment of the new regiments being about completed, all recruiting officers were instructed to make a specialty of recruiting for the artillery.

Under act of February 2, 1901, and the orders of the President, the total enlisted strength authorized for the Artillery Corps was fixed at 18,862. The maximum enlisted strength of the artillery according to the act of March 2, 1899 (irrespective of the temporary increase authorized by the President, under section 12 of that act), was 8,050, the total increase authorized being 10,812. It was decided to divide this increase into increments of one-sixth, or 1,802 each, and, as each increment was reached, to appoint one-sixth of the additional officers and organize one-sixth of the additional companies. These increments have been completed by recruitment, supplemented by transfers from organizations of other arms that were in excess. The losses in the artillery from February 2 to the present time are still to be made up, and, as the expirations of service in that corps will be heavy for several months, active recruiting therefor is necessarily kept up.

ENGINEER BATTALIONS.

The Second Battalion sailed for the Philippines June 25, having been recruited to very near the maximum strength. The few recruits needed to complete its organization have since been forwarded to Manila.

Of the Third Battalion, one company stationed at the United States Military Academy, West Point, has been practically completed; the other three companies of that battalion stationed in the United States have been recruited to a strength of 257 men.

One company of the First Battalion has recently been brought to the United States from the Philippines, and there are sufficient recruits at rendezvous to fill it upon reaching its new station. The other three companies of that battalion are under orders from the Philippines for the United States.

RECRUITS FOR TROPICAL SERVICE.

Up to May, 1901, special efforts were directed to filling portions of the old regiments designated for service in the Philippines. All organizations sailing for the Philippines have been filled with recruits prior to their departure from the United States; the number of recruits thus supplied between February 27 and July 25 to organizations about to sail as indicated being 1,417. Between September 20, 1900, and September 20, 1901, 3,868 recruits were forwarded to organizations already in the Philippines or China, while on the latter date there were 158 recruits at San Francisco awaiting the sailing of transports. During the same yearly period 1,130 recruits were forwarded to Cuba and Porto Rico for organizations serving in those islands.

GENERAL RESULTS.

The total number of enlistments and reenlistments in the Regular Army during the fiscal year ending June 30, 1901, exclusive of the Hospital Corps, was 30,622; of which number 24,978 were made at city stations by officers of the general recruiting detail, and 5,644 at and in the vicinity of military posts and in the field, by recruiting officers detailed by their commanding officers.

The enlistments are classified as follows:

For the general service	29,751
For the Porto Rico Provisional Regiment of Infantry	398
For staff departments	473
Total	30,622

Of the 30,622 accepted applicants, 26,267 were native born, 3,977 of foreign birth, and 378 were born in Porto Rico; 28,879 were white, 1,707 colored, and 36 Indians. The enlistments numbered 25,688, and the reenlistments 4,934. Excluding reenlistments, the percentage of native born among the original enlistments was 89. The reports show that the recruiting officers making the 30,149 enlistments embraced in the first two items of foregoing list rejected 86,407 applicants, about 74 per cent of the whole number, as lacking in either legal, mental, moral, or physical qualifications; 1,645 of these were rejected as aliens, and 4,244 as illiterates.

The total number of enlistments and reenlistments for the Hospital Corps during the fiscal year was 836, of which number 666 were native born and 170 of foreign birth; 814 were white and 22 colored. The enlistments numbered 610 and the reenlistments 226.

Including the Hospital Corps, the aggregate of all enlistments and reenlistments for the Regular Army during the fiscal year ending June 30, 1901, was 31,458.

THE ADJUTANT-GENERAL'S DEPARTMENT.

The act of February 2, 1901, increased the organization of the department, which now consists of one adjutant-general, with the rank of major-general (the rank of that officer to be that of brigadier-general on the expiration of the service of the present incumbent by retirement or otherwise), five assistant adjutant-generals, with the rank of colonel, seven assistant adjutant-generals, with the rank of lieutenant-colonel, and fifteen assistant adjutant-generals with the rank of major.

During the past year the department has lost three officers—one by promotion and two by retirement, viz:

Col. Theodore Schwan, who was appointed brigadier-general in the regular establishment February 2, 1901 (since retired). Colonel Schwan, as brigadier-general of volunteers, served with credit to himself as chief of staff of the Division of the Philippines and principal assistant to the military governor of the Philippines.

Col. Merritt Barber, retired June 30, 1901.

Col. J. C. Gilmore, retired April 18, 1901.

The law above cited forbids further permanent appointments in the Adjutant-General's department after the filling of the original vacancies created by the act; vacancies that shall occur, except that of the chief of the department, which can not be filled by promotion, to be filled by detail from the line of the Army; all officers so detailed to serve for a period of four years, after which they shall return to duty with the line and, if under the rank of lieutenant-colonel, shall not again be eligible for detail until they shall have served two years with the line.

Eleven officers of the line have been appointed by detail to fill original vacancies, and the promotions made consequent on retirement and increased strength leave three vacancies yet unfilled.

GOVERNMENT HOSPITAL FOR THE INSANE.

The following is a list of persons committed to the Government Hospital for the insane, under the order of the Secretary of War, from September 1, 1900, to September 1, 1901.

Officers of the United States Army	2
Officers of the United States Army (retired)	1
Enlisted men of the United States Army	115
Enlisted men of the United States Army (retired)	3
Enlisted men of the United States Volunteers	42
Late soldiers of the United States Army	4
Total	167

CYCLONE AT GALVESTON, TEX.

On Saturday, September 8, 1900, a violent storm set in at Galveston at 9 a. m. and continued with increased violence until after midnight, inundating the island, destroying all means of communication, and causing the death of hundreds of persons. The height of the tide was from 11 to 13 feet, and the several forts in the harbor were practically destroyed. The troops suffered severely, Battery O, First Artillery, losing 23 men (the survivors saving nothing but the scant clothing on their persons), and the sweeping away of the hospital at Fort San Jacinto, and at Camp Hawley caused the death of three men of the Hospital Corps, and of the hospital matron.

In view of the appalling disaster and of the pressing needs of the starving and homeless surviving population of Galveston, the War Department took prompt measures to afford temporary relief by the issue of 50,000 rations and 1,000 tents. In addition, it placed the transport *McPherson* at the disposal of the relief committee of New York City to take from there direct to Galveston the supplies collected by the committee.

The absence of legal authority to apply the property of the United States to any purpose not specifically mentioned is the cause of much embarrassment in sudden emergencies demanding prompt action, by the reason of the conflict between natural inclination and the technical limitation of authority. It is hoped, therefore, that the attention of Congress will be specially called to the general subject, with a view to a legal enactment formally granting full power to the President, in his discretion, to afford in similar cases whatever relief is absolutely necessary.

THE ADJUTANT-GENERAL'S OFFICE.

The legal organization of the regular force of this office remains unchanged. The conditions which made the employment of temporary clerks necessary still existing, although modified, the temporary force has been continued. The disadvantage referred to in the last report, resulting from overcrowded rooms still retards the prompt discharge of business and is becoming worse by the constantly increasing volume of files and papers. It is earnestly requested therefore that Congress be urged to an early consideration of the deplorable existing conditions, with a view to such action as that body may deem necessary. The statement is reiterated that the safety load that may be placed on the floors of this building has been unavoidably exceeded in some of the rooms allotted to this office.

The present clerical force of this office, regular and temporary, will be as imperatively required in the future as it has been in the recent past. The increase of the Army involves a great increase in the number of promotions, each of which is based on professional examination of the officer, many of the reports leading to further official correspondence. New appointments in the lower grades, from late volun-

• teer officers, enlisted men, or civilians, involve the classification of the applications, many of these supplemented later by such letters of recommendation as the applicants can secure. These papers have to be examined and listed, records examined, candidates selected, examination boards appointed, etc., making in the aggregate a vast amount of work. While the volunteer force has been mustered out of service, the Regular Army has been increased nearly fourfold. Volunteers are received into service as complete organizations, while the regular soldier is enlisted singly. The monthly average number of enlistments in 1897 was 840; it now exceeds 3,000. The strength of the Hospital Corps has been increased from 725 to 4,310. The men composing that corps, being widely scattered, form hundreds of detachments, each of which requires a separate muster roll.

This subject, briefly presented above, is especially dwelt upon because of the erroneous impression existing that, because active hostilities have very largely decreased and the volunteer force disbanded, the essential work of the Adjutant-General's Office cannot require the continuance of its present force, which is, in fact, only double that found necessary to properly administer the executive business of an army of 25,000 men, now increased to over 70,000.

As many of the temporary clerks have demonstrated their fitness and efficiency during a service varying from two to three years, it is urgently recommended, as simple justice to meritorious men, that, under such special rules as may be deemed necessary, Congress authorize the names of temporary clerks recommended by the head of the Bureau in which employed and approved by the Secretary of War to be placed on the civil-service register of eligibles and entitled, according to their respective merits, to transfer to the regular roll on the happening of vacancies therein.

All the subordinate officers of the department have, without exception, performed their duties with zeal and intelligence. It is not too much to say that the Government never had a more loyal, intelligent, and faithful set of public servants than they have shown themselves to be.

SUMMARY OF RECOMMENDATIONS AND REMARKS OF INTEREST CONTAINED IN REPORTS OF GENERAL AND GENERAL STAFF OFFICERS.

The following is a summary of the recommendations and other subjects of interest affecting the Army, contained in the annual reports of the military commanders and their general staff officers, collated and submitted for the information of the Secretary of War and the Lieutenant-General of the Army:

— — —

Maj. Gen. Arthur MacArthur, commanding the Division of the Philippines (to July 4, 1901), makes a very extensive report covering both the civil and military administration of the islands, which is of peculiar interest, but the military and civil directions being interwoven so closely, only a summary of the purely military subjects are extracted, for the whole subject is of such importance that the full text of the report should be considered in its entirety to properly appreciate the Army's achievement in the Philippines.

A systematic narrative is impossible of the affairs, skirmishes, and combats which resulted from incessant activity throughout the extensive zone of hostilities presented by the Philippine Archipelago, which, it must be remembered, is subdivided

by intervening seas passable only, for military purposes, by means of sea transportation, the difficulties attending the employment of which make concentration in particular islands, for emergency purposes, a complex and exhaustive undertaking. Since May 5, from which date the command passed to the undersigned (General MacArthur), a diary embodying chronologically a list of military events has been compiled semimonthly for the information of the Department, which means that during the fourteen months referred to 743 pages of typewritten reports have been forwarded, almost every one of which is replete with references to splendid achievements alike creditable to the Army and the individuals concerned.

As the best means of condensing these voluminous records within the limit of a single view, the following recapitulation is respectfully submitted, embracing the period between May 5, 1900, and June 30, 1901, during which time 1,026 contacts transpired between the American troops and the insurgents:

American casualties.

Killed	245
Wounded	490
Captured	118
Missing	20

Insurgent casualties.

Killed	3,854
Wounded	1,193
Captured	6,572
Surrendered	23,095

During the same period the following material was acquired from insurgents:

	Captured.	Surrendered.	Total.
Rifles	4,871	10,822	15,693
Rifle ammunition	206,399	89,966	296,365
Revolvers	397	471	868
Bolos	1,409	2,107	3,516
Cannon	87	35	122
Cannon ammunition	8,100	2,170	10,270

In consideration of important immediate results, and in the light of remote consequences likely to arise therefrom, the capture of General Aguinaldo may be regarded as the most momentous single event of the year. As a military transaction it was unique, isolated, and complete in itself, the details of which will be found carefully described in the report of General Funston. Aguinaldo was delivered at Malacanang March 28, 1901, and remained there until April 20, 1901, pending cable discussion with the Department in respect of questions of policy and expediency growing out of the capture, the practical importance of which can not be overestimated. * * * The consequences which have arisen from the capture of Aguinaldo have justified every expectation in the premises. All subsequent surrenders have been more or less influenced and expedited thereby, and many of the most important events of this character must be attributed entirely thereto.

In order to comply with the terms of the law of March 2, 1899, which specifically declared June 30, 1901, as the limit of service of the volunteers therein authorized, it was necessary to commence moving the troops toward San Francisco early in January, 1901. At this time it was not entirely apparent what useful effect would arise from the new campaign which was fully systematized and put into operation December 20, 1900. As a consequence, the withdrawal of these splendid regiments, in the midst of important military movements, raised something in the nature of a crisis, to overcome which considerable ingenuity was required to create supplementary contrivances by which gaps in the fighting line could be partially filled pending the arrival of regular soldiers from the United States.

It was absolutely essential that all occupied territory should be held, that activity in every direction should be maintained with undiminished vigor, and every effort made to obtain decisive results before all the volunteers could be withdrawn. With a view to fully accomplish these various ends, watchmen were employed to replace soldier sentinels wherever possible, native scouts and native police were multiplied to the limit of safety, and an American police was organized for duty in Manila. The considerable force which by these means was relieved from duty in the city and vicinity became available for service in remote parts of the islands.

By April 1, 1901, it became apparent that the insurrection was rapidly approaching complete collapse, and as a consequence the homeward movement of volunteers thereafter was accomplished without creating any sense of concern on account of the military situation.

All efforts to systematize the operations of war have, to a great extent, been defeated by limitations arising from undetermined conditions touching the development of abstract theories and touching the evolution of material things employed by troops in campaign. For example, organization and tactics have induced endless discussion and may still be regarded as in a transitory state; the ballistical qualities of firearms have been advancing progressively for several hundred years, but notwithstanding great improvement has been made there is still considerable scope for inventive ingenuity. Equipage of all kinds, guns, gun carriages, and even harness, are all subject to challenge. In these particulars much discussion has taken place, and an enormous speculative literature has accumulated, in many instances, apparently, attaching to unimportant minutiae. That every issue, however, no matter how trivial it may seem in itself, is of serious import to nations is abundantly demonstrated by the fact that the development and application of a new principle or invention involving only a few differences in tactics or small improvements in weapons, before an adversary has come to understand or appreciate the importance thereof, has frequently led to decisive results in war.

The foregoing premises have been introduced for the purpose of emphasizing by means of strong antithesis, and thereby attracting especial attention to the one factor in war which is by far the most important and which is also absolutely immutable; that is to say, the capacity of a man has always been, is, and always will be, an invariable quantity. His strength may be assumed to be uniform and constant, and accordingly everything appertaining to the care of his body, through which medium his military energy is conserved and expressed, may be made a matter of calculation with results entirely certain and positive.

Mankind under the most favorable conditions is hedged in on all sides by sickness and physical suffering. Soldiers in campaign, more than others, are exposed to hardships and dangers, the exceptional consequences of which can only be mitigated by solicitous attention to everything in regard to clothing, nourishing, and doctoring their bodies. Purely as an economical proposition, it pays to keep soldiers in good health and strength regardless of the immediate cost. The conclusion is therefore reached that in war every resource of administration should be invoked to devise new and ingenious methods of spending money, so long as money alone is required to keep the soldier in good health, which means to keep him contented and efficient. It is not intended to advocate wastefulness or wanton extravagance, but simply to generalize to the effect that money spent to the limit of useful effect in behalf of the health of soldiers in the field is in the long run practical economy.

In respect of the particulars above referred to, the service of supply in this army has been more than satisfactory. The clothing furnished has been abundant, and well adapted to the climate and the nature of the service. Several articles of issue, in quality and fit, are not precisely what is desired, but as this branch of the subject touches appearance, and not hygiene, it does not fall within the limits of the present discussion.

The service of subsistence has reached almost the limit of possibility. All necessary articles, practically regardless of cost, have been furnished in abundant quantities. Questions have arisen as to the components of the field rations, but as this involves simply questions of discretion and judgment, and not of money, it is excluded from consideration in this place. The distribution of rations has at times been impeded, and for brief periods certain commands have had scant supplies, but these conditions arose entirely from exigencies of military operations, and not from inadequate supplies.

In alluding to the difficulties attending the alimentation of troops in campaign, a distinguished commentator recently remarked: "Feeding large armies during active operations in the field may be looked upon as a problem as yet in the main unsolved and as one, indeed, that will always remain so." This is but partially true, and applies forcibly only when armies are trained to live on the country, when there is a scarcity of money, or where the money is available, but is reluctantly disbursed. The latter policy, predicated upon the idea that money is more important than men, can never be considered seriously as a useful principle of either ethics or economy.

As a matter of fact, the United States, by a wise combination of intelligent administration, and generous use of money, has solved the problem of alimentering an army in the field, under any and all conditions that can possibly arise in war. Within forty years this system has been successfully applied to commands of all kinds, from small detachments, foraging against Indians, to large armies conducting regular operations over great distances and for long periods of time.

All things considered, the medical service during the year has not only been satisfactory, but has been exceptionally creditable to the entire service. The generous supplies furnished by the War Department have made it possible to maintain health conditions probably never before attained in the Tropics. Attention is especially invited to the report of the chief surgeon, appended hereto. There is nothing more certain in military administration than the general proposition that the efficiency of an army in the field will be in direct proportion to the generosity of the medical administration.

As in the Quartermaster's Department, many articles of issue in the Medical Department might be of better quality, but the general service during the year has been so admirable, both in Washington and Manila, that it seems inappropriate to introduce any discordant strain of hypercriticism.

Military service in the archipelago since American occupation has in effect made pioneers of the soldiers who have at any time participated therein, and in that capacity has connected them with a great historical event, the remote consequences of which can not at present be foreseen. It is apparent, however, at this stage of the evolution, that the men thus employed have enjoyed an important privilege by reason of assignment to station on these distant shores. As an abstract question, this peculiar advantage has not at all times, perhaps, been fully understood or appreciated; but as a practical proposition the soldiers of the Army have so wrought and fought as to establish the belief that each one was actuated by the idea that upon his individual exertions depended the issue of the campaign. With such a responsive and flexible organization the functions of command have been made easy, and the burden of responsibility reduced to the lowest terms. It therefore becomes an exceedingly agreeable duty to record in permanent form a warm expression of admiration and thanks for the many acts of good soldiery performed by these splendid men in behalf of republican institutions.

To protect occupied territory and the inhabitants thereof against the depredations of ladrones and armed robbers, and at the same time to afford the most desirable bases from which to conduct field operations against insurgent guerrillas, has required subdivision of the Army into an infinite number of small posts, from each of which have issued ceaselessly and aggressively small detachments moving against whatever could be found to attack. Incessantly trained by these means, the soldiers of this army have acquired in an unusual degree the true spirit of discipline and adventure, and at the same time have developed a high sense of fortitude, patient endurance, self-reliance, and personal responsibility, and so have attained the very best characteristics of the military profession.

Recruited from a hardy and valiant race, largely representing the self-respecting, robust, and well-regulated young manhood of America, every demand upon their endurance and courage has been responded to with patriotic fidelity. They are a credit to the nation, and deserve the affectionate gratitude of the people of the Republic. These remarks are intended to embrace all men who have at any time rendered military service in the Philippines.

Maj. C. P. Miller, chief quartermaster, Division of the Philippines, reports that the time will soon come for a decision as to the location and size of permanent garrisons; that hitherto it has been found more economical to take what buildings were suitable and adjust the question of rents afterwards. Stables have been built for animals at a cost of \$5 or \$6 per horse. The cost of renting buildings for troops has been \$4 or \$5 per man. Quarters for officers have been rented and assigned, one or two rooms to an officer. He calls attention to the way the American mules and horses stand the climate. Many have been killed for glanders, but otherwise their condition is as good and the loss as little as in the United States. Native grass is used in feeding to a considerable extent. The work of the depot quartermaster has been divided since the last report into several offices under their appropriate officers: The land transportation office, water transportation office, and an office in charge of construction, repairs, and rents. Several large shops under the depot quartermaster turn out water and garbage cans, field ranges, boilers, office furniture, harness, etc., with much economy to the United States. The Quartermaster's Department has an agent at Nagasaki attending to all matters of sup-

ply and repairs of army transports at that place; another at Hong-kong purchasing launches and material for the Quartermaster's Department.

Capt. Thomas Cruse, depot quartermaster at Manila, reports that on taking charge of his office he found a great deal of property being lost and misplaced, and what was wanted was a complete reorganization of the water transportation service. The chances for loss at Manila are great, since the vessels unloading lie out in the harbor two or three miles, necessitating the handling of freight sometimes three times. He thinks the check system now in vogue as the result of his reforms is bound to insure correct delivery or locate where the fault lies. He states that the schedule of sizes for clothing in the United States can not be followed in this country, since the average soldier, after serving here for a short time, becomes thin, with the result that a man that takes trousers with 30-inch leg and 36-inch waist will be using a 30-inch leg and a 32-inch waist.

Capt. Archibald W. Butt, assistant quartermaster, in charge of land transportation, reports there are 822 employees on his rolls, and that the native labor is capable of the most expert workmanship in many branches of the Quartermaster's Department. As painters, carpenters, saddlers they excel, their wages being from \$14 to \$30 gold per month. Moreover, there appears to be no friction whatever between the American and native labor, the two working side by side in perfect harmony. Captain Butt sees no necessity for introducing Chinese labor into these islands; his experience is that any labor which can be performed by the Chinese can be performed equally as well by the Filipinos, the Filipinos having the advantage of being more amenable to discipline, more imitative in their methods, more enthusiastic in their work, and more easily assimilated by the American workmen. Regarding the American horses and mules, he says the stock is in exceptionally fine health, he having on hand 1,253 American horses and 568 mules, and there being but 110 head in the hospital. Glanders did not appear to be as prevalent among the American horses as among the native stock, and that the glanders develops more slowly and is not as serious in the Philippines as that in the States. He states that the Filipinos do not make good teamsters, by reason of the fact that they do not possess the necessary strength to handle the American horses, and that packers and teamsters sent from the United States are many of them worthless, and it is recommended that before leaving the United States they be given a preliminary test.

Maj. J. B. Aleshire, quartermaster, United States Army, in charge of the army transport service, reports that 73 steam vessels are in service in the Philippine Islands, and of these, seven steamers, costing \$1,815 per day, or \$589,475 per year, are chartered; that a number of lighters and cascoes that have been chartered by the Government have been released since the 1st of April, reducing expenses over \$1,000 a day.

Maj. Robert R. Stevens, chief quartermaster, Department of Northern Luzon, reports that great advantages in lessening the burden of scouting duty and escort duty have been obtained by assigning 100 or more American horses to each regiment of infantry; that he has been able to construct nipa barracks for troops, capacity one company, at an expense of not exceeding \$700; that stables for 100 horses cost \$500 or \$600. He reports the employment for transportation purposes of

bull carts, canoes, Australian or trotting bulls, burden bearers, litter bearers, and native ponies. He recommends the purchase of steamers of about 1½ feet draft, about 70 feet long, and 12 feet wide for carrying supplies on rivers. Such vessels should have good speed to overcome the current during high water; and that the rivers form the most effective line of supplies, but it is important that measures be taken at once for removing bars from the mouth of the rivers and for the improvement of their navigation.

The chief commissary, Division of the Philippines, Col. C. A. Woodruff, United States Army, reports that since the date of his last report he has supplied a command extending from the great wall of China on the north to the island of Borneo on the south and the island of Guam on the east. Besides the ordinary rations, the subsistence department supplied rations for 4,000 prisoners of war, 1,800 marines, many stores for the navy, rations for 1,000 civil employees, sales stores for army, navy, and marine officers, and for the Philippine Commission and attachés and all American military and civil employees, for the metropolitan police, scouts, transports, etc. He says that an English writer said, "The American commissary is undoubtedly far the best of all, and the American soldiers are the best fed, both in peace time and in the field."

When possible to supply, fresh beef and 100 pounds of ice per company per day were furnished the troops. Contrary to the idea of the theorists, nearly every report indicates that the present army ration is about perfect for service in the Tropics.

Col. Charles R. Greenleaf, assistant surgeon-general, chief surgeon, Division of the Philippines, reports an improvement in the health of the troops and a decrease in deaths. The proportion of sickness would be very small if it were not for, first, the inevitable undermining of the strength of the most robust by tropical service and, secondly, the increase of venereal disease. The most energetic and stalwart American, after a year of service here, loses energy, strength, and ambition. Slight ailments are more felt and the number of entries for trivial complaints on the sick report increases. Among the sicknesses, malarial fever attains the highest rate. The percentage of dysentery remains about constant. Diarrheal and gastric disorders show a slight increase, due to long service in the Tropics. Wounds and injuries show very little variation. From August to April 165 men were killed in action; 24 died of wounds; 366 received wounds not fatal. The steady increase in venereal diseases among our troops, from 8.97 per cent in September, 1900, to 20.42 per cent in April, 1901, furnishes ground for the greatest apprehension; and lest our forces become seriously crippled and an irreparable injury be done to the people of these islands, the subject must be looked squarely in the face and dealt with as with any other contagious disease. We spend thousands to prevent the spread of smallpox and yellow fever, yet we let this evil spread because public opinion forbids them to do otherwise. Venereal disease is spreading from Manila as a focus outward into the provinces where the native women have been hitherto free from disease. The segregation of this class of women in Manila to certain parts of the town, a supervision of their houses, and a duly recorded treatment of the diseased should be systematically carried out. Colonel Greenleaf reports the mortality rate of the troops as 20.45 per cent per thousand per annum. The proportion of officers killed in action is very great, being 13 officers

to 252 enlisted men. He reports the expense which would be incurred in establishing a great sanatorium in Benguet requires that caution should be exercised in the matter. The result of troops actually camping there should be known. He noted that out of 445 convalescents sent to the United States for treatment in September, 1900, 129 were under 21, or 29 per cent of the whole number. He says that young boys are more imprudent concerning their own health and less resistant to the disease-producing agents, and should not be sent to the Philippines. From August 1 to April 30 the number of invalids sent home for treatment was 3,993, this number including many volunteers and trifling cases. One hundred and twenty-one insane soldiers have been sent to the United States because of insanity, the cause to be looked for in the general conditions surrounding soldiers' lives in the Philippines, acting upon predisposed men. Contrary to general belief in the United States, there is not much disability from alcoholism. Colonel Greenleaf reports that improvements most urgently needed in Manila are a system of drains and sewers, dredging and cleaning moats and canals, and a pure and ample water supply. Bubonic plague exists in Manila, 245 cases with 199 deaths having occurred. One hundred and fifty-nine lepers are under treatment. He reports the total number of prisoners of war as 4,149 men, of which the total number of sick, between March 10 and April 10, were 1,336, 697 cases being from beri-beri.

Brig. Gen. George W. Davis, provost-marshal-general, reports his Manila command on May 31 as being 180 officers and 2,670 men of the United States Army, 696 men of the metropolitan police, and 682 men of the native police.

The reports from the commanding generals of the Department of Northern Luzon, Department of Southern Luzon, Department of the Visayas, Department of Mindanao and Jolo show remarkable activity on the part of troops in holding down the bands of insurgents, and point to many instances of extraordinary bravery on the part of both Regulars and Volunteers and much wisdom in dealing with perplexing problems. Much work is shown to have been performed by small detachments of mounted infantry; the use of horses to carry infantry to vicinity of the enemy's position being shown to be very desirable.

The report of Brigadier-General Funston regarding the capture of Aguinaldo is included in full, and a full statement of this occurrence given. The splendid work the army has done in the establishment of schools and civil government in the towns is shown in these reports. The wisdom of enlisting volunteers directly into the service of the United States, without the aid of the States, of officering the higher grades in these regiments with picked officers from the Regular Army, is shown by the remarkable success of these regiments in field service.

Maj. Gen. Adna R. Chaffee, commanding China relief expedition, under date of May 14, 1901, reports that United States troops in China have not been employed on the offensive since September, 1900. The duty of the troops has been garrison duty, except that four companies of the infantry and two troops of cavalry have been employed in maintaining order in the various sections of Peking.

When it became known that we were to withdraw from Peking, the people in this section made strenuous efforts to have the order withdrawing our troops suspended.

General Chaffee invites attention to the loss of public stores while in transit. In his opinion neither agents nor guards can be excused from blame for participation. Rough handling has something to do with the loss, as broken boxes make pilfering easy. The boxes are found with part of the contents taken out, other substances put in place, and the boxes looking as if they had never been tampered with.

Company property was packed in a horrible condition for handling by the Quartermaster Department, and in enormous bulk, with the result of hampering the transportation service of the army. He recommends that a telescopic hand bag of canvas be supplied as a substitute for lockers and trunks. He praises the method of packing of the Japanese, whose boxes and sacks are bound with rope, preventing tampering with the boxes.

He states there has been much drunkenness and dissoluteness to contend with, and as the canteen in his command had not been in operation but for a month prior to February 1, 1901, and during that time the effects for good were very noticeable, it can not be said that much insobriety has been caused by the canteen.

General Chaffee reports that from every commander of the various forces and the ministers of the different nations he has received many courtesies.

Capt. Grote Hutcheson, Sixth Cavalry, inspector-general of troops in China, recommends instead of present uniform a khaki-colored uniform of cotton for summer and wool for winter, loose-fitting trousers tightly buttoned about ankles, with leggings. For full dress an ornamental collar, with simple shoulder knots that could be readily attached to service blouse. He criticises the campaign hat as unsoldierly in appearance, losing its shape at first wetting.

He says our officers generally fail to present the smart trim appearance of the foreigner, this being due to the somberness of their uniform and a lack of care and attention to their clothing in the field.

He recommends for shipment of goods the adoption of a box whose bottom shall be the same, but the height ranging according to the nature of the stores.

Capt. Irwin E. Bennett, acting chief surgeon, China relief expedition, reports that, considered from the standpoint of health alone, the expedition has been a remarkable one. Subjected to the conditions of actual warfare under the most disadvantageous circumstances, the percentage of noneffectiveness, including those incapacitated by gunshot injuries, has but once (September) reached 10 per cent of the strength of the command, and never approximating these figures thereafter, descending, on the contrary, the following month to 0.07, and showing a gradual subsequent diminution to the present time.

Capt. Grote Hutcheson, Sixth Cavalry, acting judge-advocate, China relief expedition, reports:

There have been 2,414 convictions of enlisted men in five months, of which 244 were by general courts-martial.

The maximum number of men with the command at any time was 5,064.

He thinks that this large number of trials and convictions is due to there being many men in our ranks who are irresponsible and can not

be controlled except by the most severe measures. It is also due to the inexperience and comparative youth of many of our commissioned officers and the disappearance from the ranks of our old noncommissioned officers.

He recommends, in the field, instead of the present "cumbersome" methods, the summary methods of foreign armies, where the captain of the company metes out punishment at once.

He refers to the lack of instruction and discipline of our commissioned officers, recommending the early reestablishment of service schools. He regards the canteen as an aid to discipline and orderly conduct.

Brig. Gen. Leonard Wood, U. S. A., commanding the Department of Cuba, reports a scarcity of officers in the department, notwithstanding which his command is in an efficient condition.

During the past fiscal year the Division of Cuba was abolished and the Department of Cuba established, absorbing the Department of Habana, the Department of Pinar del Rio, and the Department of Santiago and Puerto Principe.

The Department of Cuba now contains 1 artillery and 11 cavalry posts, and includes the District of Santiago, commanded by Col. Samuel M. Whiteside, Tenth United States Cavalry.

General Wood devotes much space to a description of the instruction of coast artillery in target practice, in which the foreign guns captured from the Spanish, as well as the American guns, were used. He states that a systematic course of instruction in packing is in progress for cavalry officers. He commends Pack-Master H. W. Daley, who reorganized all the pack trains in the island, as the most efficient expert on packing in America, and recommends that he receive the title of chief pack-master, United States Army, at a salary of \$200 per month.

He states horses and mules are fed one-half green forage with beneficial results and with increased economy.

He states it is due to the strenuous efforts of the Medical Department, with the cooperation of the Sanitary and Quartermaster's departments, that yellow fever has been now almost driven from the island. The health of the troops has been much better than in preceding years. He states that during the summer of 1900, 5 officers of his staff contracted yellow fever and 3 died, including Maj. George S. Cartwright, quartermaster; Maj. M. R. Peterson, commissary of subsistence, and Capt. Frederick M. Page, Porto Rican Battalion. Forty-eight headquarters' employees also contracted yellow fever and 11 died.

Among the reports of staff officers, that of Maj. Valery Havard, chief surgeon, is notable.

Col. George H. Burton, inspector-general, Department of Cuba, reports the posts, troops, transportation, and supplies in a satisfactory condition. He criticises the cavalry in that all organizations are more or less deficient in the schools of the soldier and of the trooper, there being insufficient instruction given recruits. This is also the case in the artillery. The men physically are fine. Horses in excellent condition, except that they are liable in Cuba to contract eye disease and lockjaw, from which a considerable number have been disabled. Wheel and pack transportation in excellent condition. Quarters good.

Results at target practice not as good as might be desired. He criticises the accumulation of large company funds, due to excessive profits of the post exchange. He states that the deficiencies and inconsistencies of the drill regulations for cavalry are responsible for much profanity in the Army. He says there is a general complaint that a number of men are being enlisted who are under age and physically unsuited; and that many horses received were unfit for cavalry duty. He says that the younger officers of the Army believe that a law should be enacted requiring physical examinations of officers of the higher grades before promotion. He recommends that the decision of summary court officers be substituted for that of boards of survey in regard to losses, stating there seems to be a lack of responsibility felt by the members of board of survey.

Maj. Edgar S. Dudley, judge-advocate, Department of Cuba, reports that in his opinion the time has come for a modification of the Foraker law so as to give some latitude to municipal corporations in the matter of municipal franchises. Among the most important changes in laws have been the replacing of escribanos in courts by salaried recorders and introduction of the writ of habeas corpus into the existing legal system, the modification and simplification of the law of criminal procedure, the establishment of correctional courts, and the legalization of the religious marriage ceremony.

Maj. George M. Dunn, judge-advocate, Department of Cuba, recommends that the fifty-fourth, fifty-fifth, and fifty-eighth articles of war, not being now applicable to service in foreign countries (they now apply to service in the United States only), should be made so; that the limitations on the hours of trial in the ninety-fourth article of war be made subject to the discretion of the president of the court; that the employment of stenographers on general courts be made obligatory when practicable.

Discussing the abolition of the canteen, he says that during November, December, and January, 1900, with the canteen, there were 189 convictions for drunkenness, and during the months of March, April, and May, 1901, the canteen having been abolished, there were 275 convictions for drunkenness, or nearly twice as many, due to the abolition of the canteen. The men, too, suffer as much from a restricted diet as they do from bad rum: the profits of the canteen, formerly used for the purchase of butter, eggs, and fresh vegetables, being reduced more than one-half, so that now the sober men get fewer vegetables and drinking men get more rum.

Capt. Chauncey B. Baker, chief quartermaster, Department of Cuba, reports that a competitive trial was made in June between the *Aparejo* and Moore pack saddles, the Moore pack saddle being found, in his opinion, entirely unsuited for severe field service. He recommends that no Moore pack saddles be hereafter issued in that department. The amount saved in the department during the year by substituting green grass for straw for bedding was, without counting cost of transportation of American hay, \$15,252. He reports 1,275 school-teachers carried to the United States and back by United States transport. He reports on the relative merits of four kinds of ovens and field ranges, stating that the Hunt range and the Buzzacott range are the most desirable.

Maj. Valery Havard, chief surgeon, reports that the health of the troops has shown a steady improvement upon former years,

statistics showing that the ratio for admissions to hospitals, and the ratio of mortality have approached very closely those of the United States. The ratio of admissions for common infectious diseases is much lower than in the United States; for tuberculosis it is higher, which would seem to show that a high and equable temperature is not the best for consumption. The record for syphilis is bad, nearly double that of the United States, notwithstanding municipal inspections of prostitutes. The ratio of alcoholism is double that of the United States, and is attributable to cheap alcoholic drinks. He believes that malarial fever will be practically eliminated on the island hereafter, and states that in the summer of 1900 a board of medical officers met for the purpose of investigating yellow fever, and the result of their experiments was one of the most brilliant medical discoveries of the age, namely, the mode of transmission of yellow fever; and, as a natural consequence, a complete revolution has taken place in the methods adopted to prevent and combat this disease. He criticizes the field uniform for its lack of military neatness and smartness, the combination of khaki trousers and blue shirt is not effective from a military point of view. Food is generally satisfactory. The vexed question of the quantity of meat which should be consumed by the soldiers in this climate is practically solved by common experience. While the men do not eat quite as much food in Cuba as in the United States, the proportion of meat eaten (to other constituents) is fully as great.

Regarding female nurses, he states that, despite the wisest regulations, female nurses will be now and then, perhaps without any fault of theirs, a troublesome and demoralizing factor at posts. He believes that it is in the interest of the service to employ them at only large important hospitals, never less than two or three together.

The death rate of Habana (24.26) has changed but little during the last six months. Conditions can not change until cesspools have been replaced by sewers.

Maj. Gen. John R. Brooke, commanding the Department of the East reports that the barracks at some infantry and cavalry posts are not constructed for the present size of companies and should be enlarged. He recommends that visitors be allowed to visit certain parts of coast defenses, see the guns, and witness the drills. He thinks that no harm can result; that similar permission is granted in the naval service, thereby increasing the interest of the public in the Navy. He further recommends that all approaches to seacoast defenses from the rear be made defensible by proper lines of defense.

General Brooke makes a detailed report of his annual inspection of various forts and complains that in a number of forts and batteries the magazines were damp, the strength of the garrisons insufficient to furnish one relief for each gun; that the barracks were not properly located, being too far from the guns, and that many of the Southern posts have not proper communication in the way of roads or landing facilities, and that some of the quarters are not properly constructed; recommending that they be built to suit the climate and be made cool and comfortable. Otherwise service in the South will be at a discount, preventing the reenlistment of desirable men.

Lieut. Col. J. P. Story, Artillery Inspector, Department of the East, states that the most important problem at the present time is to

obtain officers and men to operate the mining defenses. He estimates 70 officers and 2,700 soldiers as necessary for these defenses. As it is difficult at all times to provide this number of officers and men, he recommends, as an auxiliary force, that a volunteer reserve be organized, officered by electrical engineers, and that an artillery school of mines be established at once; to which the school for electrician sergeants should be attached. He further recommends that the artillery be represented by detail of officers on the board for testing rifled cannon, and also at the Sandy Hook proving ground; that during drills and target practice all men should be present except the sick and the guard; that to the ten artillery bands already organized three be added; that all property needed for artillery equipment and for mines be carried on one return; that the present strength of the coast artillery, not being sufficient to furnish one relief for the present armament, the deficiency be met by volunteers organized in time of peace as artillery of the National Guard. He also recommends that such State militia organizations of artillery go into camp yearly for a certain period, receiving pay from the United States.

Maj. James M. Moore, chief quartermaster, Department of the East, reports that \$1,586,551.66 was expended during the last fiscal year for buildings at fifty-six posts, principally new stations for the shelter of the newly raised artillery troops.

Lieut. Col. Edward E. Dravo, chief commissary Department of the East, calls attention to the inadequate storage facilities at various posts of the department, and recommends that the chief commissary visit and inspect all posts of the department in order that such deficiencies may be discovered. He recommends that the post commissary officer be not detailed as quartermaster, as such detail compels him to devote most of his time to quartermaster duties, and throws the care of food supply very largely on the commissary sergeant. He deplors the discontinuance of the transport service to Porto Rico, with its cold storage facilities, the absence of which prevents the Government from continuing the shipment in cold storage of such commissary stores as are liable to deteriorate to their detriment; and recommends the establishment of a small cold storage and ice plant in connection with the commissary warehouses at each post, costing, approximately, \$6,000. He recommends the "concentration of subsistence affairs," and the issue and handling by the Subsistence Department, not only of food but also of the facilities for preparing it and utensils with which to eat it, including ranges, ovens, kitchen utensils, and tableware.

Lieut. Col. James A. Buchanan, commanding Porto Rico Provisional Regiment of Infantry and district of Porto Rico, reports that on June 30, 1901, the Porto Rico Regiment, United States Volunteer Infantry, was mustered out and that the Provisional Regiment was mustered in. He states that there is not a suitable drill ground in Porto Rico, with the exception of the rented ground at Henry Barracks; nevertheless, drills have been regularly performed with satisfactory results and improvement. The reservation at Ponce has many objectionable features, and he recommends the purchase of a tract of 279 acres more suitably located $1\frac{1}{2}$ miles from the town of Ponce; and also the purchase of property for a new reservation near Mayaguez, which contains 45 acres, conveniently situated, an option for which at \$70,000 has been held. He refers to the report of Captain Flagler, engineer officer, who states that \$950,000 had been expended on the public

roads, of which amount \$200,000 came from the emergency fund (act of March 3, 1899) and \$750,000 from the fund "Refunding customs revenue." He states that the work on these roads is excellent, being much better than the Spanish roads, and that it is done by contract. They give work to the destitute and open up communication in sections in which the people are poverty stricken on account of the difficulty of getting their products to market. The number of miles of road and average cost not given.

Maj. Gen. Elwell S. Otis, U. S. A., commanding Department of the Lakes, reports that military instruction has been much interfered with on account of the transient character of the garrisons, due to frequent changes and the dispatch of troops to the Philippines. He further states that with increased garrisons additional repairs and new constructions will become necessary; that a decided want is greater accommodations for military prisoners in the absence of the Fort Leavenworth prison, the post guardhouses being overcrowded; that the number of deserters captured has largely increased since the increase of the reward, and that the lack of officers at the post has interfered much with the control and discipline of the command, but that this lack of officers will be soon remedied by the new appointments.

Maj. Gen. Elwell S. Otis, also commanding Department of Dakota, reports that practice marches and military instruction and post lyceums have been interfered with by the dearth of officers present for duty, but that affairs are in a satisfactory condition. He makes no recommendations.

Maj. Philip Reade, inspector, Department of Dakota, reports that troops are fairly well instructed, except in target practice, field exercises, and problems in minor tactics; that "there is danger that the Army may relapse into the apathy on the subject of instruction with small arms that prevailed for some years after the civil war," there being a decrease in the number of qualified marksmen. That at most of the posts the question of an adequate water supply is vexatious. At Assiniboine, Keogh, Missoula, and Yates there is no sewerage system. He reports noncompliance with the law in the case of a college receiving Government aid, there being absolutely no military instruction, though the prospectus of the college (The Montana College of Agriculture and Mechanical Arts) inferentially states there is. He recommends that all military colleges be furnished with military textbooks, and that the amount and nature of military instruction be regulated by general orders from the War Department; also the amount of ammunition issued be regulated according to the size of the college; and that officers who served in the civil war, when they are retired, be given increased rank.

Maj. Gen. S. B. M. Young, commanding Department of California, reports that the officers and men of his command are well instructed and efficient, and commends the painstaking care and ability shown in the shipment of officers and men and material to and from the Philippines. He recommends as an urgent matter an increase of accommodations at the general hospital, Presidio of San Francisco. General Young shows that during the past fiscal year a total of 1,206

officers and 38,257 enlisted men returned from the Philippines and China, and that 376 officers and 14,303 enlisted men left for the Philippines and China, this including 14 officers and 201 men of the Navy and Marine Corps shipped on army transports. That there were mustered out up to June 30, 1901, 661 officers and 19,087 men, and since June 30, 1901, and ending July 5, 1901, 97 officers and 3,013 enlisted men of volunteers have been mustered out at San Francisco, completing the discharge of the volunteers.

Col. J. M. Marshall, chief quartermaster, staff of General Young, reports the shipment to the Philippine Islands of 2,031 horses and 2,062 mules; 118 horses and 9 mules died from disease or were killed to prevent contagion, and that 1,035 horses and mules remained on hand. The Mallein test for glanders was applied to horses of the Ninth Cavalry, and proved a pronounced success, every case being proven by post-mortem examination. He reports the expenditure for buildings at Fort Point, \$59,015; the contracts for construction of Fort Baker, California, \$154,547; and Fort Miley, California, \$107,154; these being new posts.

The chief quartermaster at Honolulu, H. I., reports the completion of an artesian well on the naval reservation for \$6,294.40, producing a large supply of water of excellent quality for the use of transports. No action looking to the selection of a permanent site for a military post has been taken, the present post, Camp McKinley, being only temporary.

The chief surgeon, Department of California, gives a tabulated statement of the results of physical examinations of the 22,283 volunteers mustered out at the Presidio, which shows a percentage of disability, found, of only 2.94.

Maj. Gen. S. B. M. Young, also commanding the Department of the Columbia, reports that the command has been increased by 13 officers and 630 enlisted men during the past fiscal year. Discipline, health, and efficiency has been improved, percentage of trials and desertions decreased.

Operations of the commissary and quartermaster's departments satisfactory in all respects. The supply departments are also supplying Fort Liscum, Valdez, and Camp Skagway, Alaska. Additional quarters are under construction at Fort Lawton and Fort Columbia, Wash. The posts of Fort Sherman and Camp Osborne, Idaho, have been broken up.

Brig. Gen. H. C. Merriam, U. S. A., commanding Department of the Colorado, reports that within his department there are numerous Indian tribes, including the Navaho, Apache, Ute, Shoshone, and Arapaho, and that the distribution of his troops had been influenced largely by the locations of these different tribes. He devotes much space to discussion of the condition of these Indians, saying that the conduct of all of them had been such that troops had been called out but once on their account, and that this was at the call of Indian Agent Myton, of the Uintah and Ouray agencies, December 12, 1900, to suppress disorders due to discontent of the Indians, who were aggrieved at the invasion of their reservation by white sheep herders and miners, it appearing that their agent had authorized the use by whites of unoccupied lands on the reservation, this apparently contrary to treaty rights of the Indians.

General Merriam also reports that the Shoshone and Arapaho had been more or less restless, though there was no rebellious or defiant spirit shown, the Indians being discontented under certain conditions, viz, no issue of seeds, a delay in the issue of rations, and the abolition of the sun dance, which General Merriam thinks harmless.

In practical instruction, General Merriam has required his troops to make a practice march one day each week. General conditions satisfactory.

Gen. H. C. Merriam, also commanding Department of the Missouri, republishes his orders in regard to theoretical and practical instruction of troops, requiring a lyceum two days of each week during four months of the year, also noncommissioned officers' schools. The instruction of recruits, as such, is limited in the case of infantry recruits, to fifteen days, and artillery and cavalry recruits to twenty days. Field exercises once per week, entire units being required to turn out.

The report of the officer in charge of Apache prisoners of war at Fort Sill shows a satisfactory state of affairs, and a gain of one-fifth in the number of cattle on hand. The number of acres under cultivation has largely increased. The number of persons has (apparently) decreased to 266 (?), there being reported a loss of 13 during the year. The health of the Indians continues poor, due to tuberculosis, said to have been contracted in Florida.

Maj. A. C. Sharpe, acting inspector-general, Department of Missouri, recommends as the most urgent need of the Army the reestablishment of the Fort Leavenworth and Fort Riley schools of application. Every young officer who has entered the Army during the past three years should pass through these schools as soon as possible. With a class of 200 it would require seven or eight years to pass them all through. Meanwhile great emphasis should be laid on lyceum work and professional reading and study.

Brig. Gen. George M. Randall, commanding the Department of Alaska, reports that the severe weather conditions in the vicinity of Fort St. Michael in all the latter part of the season, preventing the unloading of supplies from the transport *Kvarven*, causes him to recommend that all supplies for St. Michael be shipped in future in vessels of light draft, not to exceed 16 feet, and that they be sent in the early summer, to arrive not later than September 1, nor before June 12, the average date of the opening of St. Michael Bay.

General Randall also reports that the tendency to lawlessness in the vicinity of Cape Nome having somewhat subsided, the most important work of the department has become the construction of military telegraph lines and roads; that the telegraph line up the Yukon River from Fort St. Michael is being pushed and is expected to arrive at Fort Gibbon before September, and that the soft tundra country between St. Michael and the Yukon Valley delays construction on account of the difficulty of transportation, except during the winter. He recommends that there be employed along the line at each telegraph station two natives as line-repair men. He reports further that the work upon the trans-Alaskan military road, under Captain Abercrombie, Second Infantry, to Port Valdez and Port William Sound and Fort Egbert on the Yukon River, opening up the fine agricultural and mineral country

of the Copper River gully was prosecuted with energy, and that the crossing of the Tanana is expected to be reached next November; 60 miles lower down the Tanana is a navigable tributary of the Yukon.

Owing to the peculiarities of the country, instruction in drill and target practice has been hindered, and, as the troops must otherwise deteriorate in military efficiency, he recommends that they serve in Alaska no longer than two years.

The mails to and from interior posts go by water in the summer; during the winter by dog sled up the Yukon River to Dawson, thence to Skagway, and thence to the States. Printed matter being excluded, he recommends that all orders and circulars be forwarded in ordinary letter envelope.

The condition of the mining prospectors is reported as being more favorable. There have been less cases of destitution among them, and the same can be said of the natives for the past year.

It is also reported that there are no books in the lyceum library. The chief paymaster finds it impossible to pay troops in person during nine months of the year, and recommends that arrangements to obtain funds be made with the Alaskan Commercial Company. The chief quartermaster recommends the substitution of dog transportation for that of mule during the winter, and states with regard to reindeer that they are not as serviceable as dogs.

Col. James N. Wheelan, Twelfth United States Cavalry, commanding Department of Texas, reports that the most serious event occurring during the year was the disastrous storm at Galveston, which had been reported on already by the former department commander. He recommends that in construction of posts provision be made for the keeping together entire squadrons (the squadron being the tactical unit for the cavalry), and squadron commanders be made responsible for the discipline and instruction of their commands, and that increased accommodations be provided for one squadron at Fort Bliss, it now having quarters for but one troop. He calls attention to the "travesty upon justice," caused by the detention of one field officer and thirty-six men as witnesses in criminal cases before the State courts for eighteen months (this detention apparently still continuing). He also calls attention to the difficulty of obtaining water at Fort Ringgold, an artesian well being recommended; also to the condition of Fort Brown, on which no further expenditures can be made by order of the Secretary of War. If the post is to be garrisoned by one or more troops or companies, extensive repairs are necessary.

Capt. C. D. Roberts, acting judge-advocate, Department of Texas, reports one of the main objects of the "Act to prevent a failure of military justice" being the adequate punishment of offenders at smaller posts, which appears to be easily defeated by offenders objecting to trial by summary court, thus reducing the punishing power of the summary court and offering the alternative of either allowing the accused to escape with an inadequate punishment, or necessitating his being sent elsewhere for trial.

Maj. Peter J. A. Cleary, chief surgeon, Department of Texas, reports:

It may be well to invite attention to the medical officers serving in this department, known as contract surgeons. A more anomalous or singular body does not

exist in any army or organization in the world. They are not commissioned officers, yet they are entitled to wear uniform, and while they may wear it, they can not be required to. They perform the duties of commissioned officers, but have not the privileges or rights of one. They may be court-martialed, or may be dismissed or discharged without trial. They may be appointed without any examination as to their qualifications, or may have to undergo an examination. To enter the medical corps of the Regular Army the candidate must pass a rigid examination, and then gets the rank and pay of a first lieutenant (mounted), \$1,600. The contract surgeon may not be examined, but, if examined, the examination is not nearly so strict, and enters at once with the pay of a captain (not mounted), \$1,800.

Finally, while there are many excellent and highly qualified men in the ranks of the contract surgeons, yet, as a body, they are below par in the estimation of officers and enlisted men, and through no fault of their own, but because of the absurd and contradictory circumstances in their position, all of which have not been referred to—for instance, about quarters. One may be ordered to duty where there are no Government quarters, in which case he is not entitled to commutation as officers are, but must provide himself as best he can. It is also a fact that his pay has been stopped while off duty sick with disease contracted in the discharge of his duty. Whether this ruling prevails now or not, I have not inquired.

This condition could easily be remedied with benefit to the service, a saving to the Government, and to the satisfaction of the majority of those affected, by very simple means. Give every one of them a commission of first lieutenant (mounted), and abolish the thing forever.

We have now the medical officers of the regular establishment. We have also medical officers, assistant surgeons, and surgeons of volunteers. Now, let the contract surgeons be commissioned as additional assistant surgeons of the army and eligible for promotion to the grade of captain (mounted), and holding office so long as their services may be needed—to be appointed and commissioned by the President, on recommendation of the Surgeon-General, and to be discharged or service terminated in the same manner by the President, or on recommendation of chief surgeon, approved by the Surgeon-General.

REMARKS AND RECOMMENDATIONS.

A recent tour of the Philippine Islands and brief visit to Japan and Eastern China suggest several important needs of the service, especially of the army in the Philippines.

ARMY TRANSPORT SERVICE—MAILS AND CABLE TO THE PHILIPPINES.

The army transport service on the Pacific, which was organized as a military necessity immediately following the American occupation of the Philippine Islands, while honestly and efficiently administered under the direction of sailing masters of experience and ability, is, under the present order of things, believed to be costing the Government considerably more than its men and military stores could be carried in ships of commercial companies. Commercial steamship lines would have the advantage (denied to the Government) of transporting passengers, freight, and mails to the Orient, both on outward and homeward voyages, and meet the needs for increasing American trade in the Orient. It would seem that Congress could with safety offer certain inducements to those engaged in the shipping business of the United States to install a line of steamers under such charters as would in time of necessity serve the Government as reserve army and navy transports and while employed on regular sailings, the Government to have every facility for the shipment of men and stores.

This scheme should not only embrace our needs on the Pacific, but should be extended to all ships properly constructed and arranged for troop ships, to provide a competent service for the future and avoid the possibilities of the hardships, embarrassments, and inconveniences

resulting in the forwarding of the expeditionary forces to Cuba, Porto Rico, and the Philippines during the Spanish-American war. The Government interests would be far more economically administered than under the present method and just as efficient, and avoid in the hour of necessity the chartering of ships, few of which would be fitted or convertible into transports suitable to bunk and subsist an army and carry military stores. This was the main obstacle encountered in recent experiences, and it would seem to be no less than our duty to provide a system that would save this embarrassment to those coming after us. A well-organized and trained force of competent seamen (officers and men) would be at the disposal of the Government for transportation of its forces and war material at all times and to any destination and in good order, and with due regard for the comfort and safety of troops and the necessities of the campaign, saving the Government the employing of a large number of officers and men of either the Army or Navy—men skilled and schooled not only in navigation, but in loading, lightering, and unloading of cargoes.

Although the transport service will have to be continued for some months to come, yet Congress should take proper steps to permit the discontinuance of this service and enact the legislation authorizing the Department to advertise for bids for carrying men and freight on the Pacific, to go into effect at the beginning—say the first—of the fiscal year, such service to be surrounded by safeguards that would insure a well-regulated service in ships suitable and economical for the Government's requirements at this time, as well as looking to provisions for an efficient service in time of war.

This would also permit the Post-Office Department to make contracts for the carrying of mails upon regular schedules, which is of prime importance to our Army and the commercial interests of the islands. Ever since the American occupation of the Philippines nothing has been so uncertain as the mails and nothing so unsatisfactory to the military and civil government. The Post-Office Department in the past has depended upon the army transports to carry the mails, and the transport service, to meet the exigencies of the military service, has been, in the nature of things, very irregular. I understand that there is no contract for carrying mails, but that such carriage is wholly dependent on our transports. The Post-Office Department under these conditions has done its best to give us a good service. Another and kindred subject, and perhaps of equal importance, is the necessity for a domestic cable running from the Pacific coast to the Philippines, one over which the business of the Government can be transmitted within reasonable limitations of cost and within its own jurisdiction. I say domestic service for the reason that the cable communication now existent is through Europe, Asia, China, and Japan, and which, for obvious reasons, should be discontinued at the earliest date. The present tariff practically prohibits any really efficient service, yet the requirements and urgency of the public exigencies have been such as to compel a use of the cable, the cost of which is far in excess of what it should be, \$2.38 per word being the regular tariff of the cable companies now doing service between here and Manila.

The cipher of the Department, however, is being rewritten to adjust itself to the cable service, which, when it is completed, will insure a very considerable saving in the cost of messages over the present code now in use.

The question of water transportation will doubtless be more comprehensively treated by the Quartermaster-General in his report for this year; but the convictions which are here mentioned are the result of close observations, which make it my bounden duty to invite your careful consideration to these very important subjects for the welfare of the Army and the economy of its administration.

BARRACKS AND QUARTERS FOR TROOPS IN THE PHILIPPINES.

The comparative order now prevailing in the Philippine Archipelago would make it wise at an early date to assemble the troops at certain strategic points and house them in comfortable quarters. At this time the troops are still occupying temporary quarters in such places and buildings as are available and which in times past the military necessity required; but economical considerations now suggest the erection of permanent quarters, which will be less expensive than the present method, more conducive to the general health and comfort of the troops, and at the same time meet future military requirements.

Storehouses.—Another thing that is very urgent and which requires immediate consideration is an appropriation for the erection of storehouses in Manila and vicinity. Investigation while there showed that at this time the Government is paying no less than \$300,000 American money annually for rent of storehouses, and very largely this expenditure is being made in the city of Manila. At other principal points it was found that the old Spanish storehouses had been repaired by the labor of troops, or otherwise, so as to answer the needs of the supply departments.

If these suggestions are adopted the cost of maintaining troops in the archipelago will be scarcely more than that on home stations, and the health and comfort of the officers and men be assured.

UNIFORMS.

Recent extensive observations suggest the desirability, if not necessity, of many changes in the uniforms of officers, especially with regard to belts, shoulder knots, and shoulder straps. The heavy dress hats, now prescribed by the regulations, are cumbersome, expensive, and not adapted to the present requirements of the service. This question should have the early consideration of a competent board authorized to recommend uniforms more suitable to the present needs and wide range of our service.

OFFICERS' SERVANTS.

Officers in active service should be provided with servants duly enlisted as such, but whose compensation should be reimbursed by the officers. These men should be provided with the uniform that will distinguish them from the rank and file, and it is also important that the employees of the Quartermaster's Department—such as teamsters, farriers, wagon masters, and packers—should in like manner be enlisted for that service with a prescribed uniform different from that of the regularly enlisted men. The importance of this was illustrated in the recent experiences covering the operations in China, where there is abundant evidence that on several occasions the good name and discipline of General Chaffee's Army was called into question by the rowdiness of noncombatants dressed in most part in the uniform of a soldier.

RETIREMENTS WITH INCREASED RANK.

In the last annual report it was recommended that all officers who had served in the war of 1861-1865, and have continued in the service during the recent war with Spain, be placed upon the same footing as officers of the Navy, and retired with one grade higher than their actual rank at the date of their retirement. This recommendation is renewed and commended to your favorable consideration, and it is especially recommended that the Congress authorize the retirement of not to exceed two major-generals on the active and one on the retired list, with the rank of lieutenant-general. The Department has in mind the faithful and distinguished services of Major-Generals Merritt, Brooke, and Otis, who were general officers at the beginning of the Spanish-American war, and all of whom rendered a service that fully entitles them to this distinction. General Merritt commanded successfully the first expedition to the Orient, which resulted in the surrender of the land forces of the Spanish army in the Philippines. General Brooke, under General Miles, commanded with success and distinction the army in Porto Rico, and later rendered most valuable services as the first military governor of Cuba. General Otis succeeded General Merritt in command of the military forces in the Philippines and as the military governor of those islands, and served with intelligence and with marked ability under trying conditions from August 29, 1898, to May 5, 1900. The service of all these generals in the war of the rebellion and in Indian wars are too well known to require mention. The records of the War Department show that the promotions recommended for these distinguished officers are fully merited by services rendered, and each of them during the war with Spain exercised with marked ability commands commensurate with the full rank of general. Unless this recognition is given them our senior major-generals will pass to the retired list on the same rank they would have had if the Army had not been engaged in war and without any reward whatever for their services.

MEDALS FOR EXCEPTIONAL WAR SERVICE.

In my annual report for 1899 I took occasion to remark as follows:

The patriotism of the regulars and volunteers, who enlisted only for the war with Spain, by willingly and actively serving after the expiration of their terms of service calls for evidence of appreciation on the part of the Department. To this end it is respectfully recommended that each officer of the several volunteer organizations and each enlisted man who continued in service in the Philippine Islands after the 2d of March, 1899, until honorably discharged, be awarded a suitably inscribed medal.

To which the President, concurring in these views, remarked in his annual message, of December 5, of that year—

I recommend that the Congress provide a special medal of honor for the volunteers, regulars, sailors, and marines on duty in the Philippines who voluntarily remained in the service after their terms of enlistment had expired.

While numerous bills to this end were introduced by individual members of both Houses, and several attempts were made to secure amendments in the appropriation bills during the Fifty-sixth Congress, all of these various bills and amendments failed of passage.

It is but justice, already too long delayed, that these officers and men be provided with the medals recommended and which were so far as in

his power promised them by the Commander in Chief, the President, who, in his address before the Tenth Pennsylvania Volunteers, at Pittsburg, Pa., on the 28th of August, 1899, said: "Every one of the noble men of the Regulars or Volunteers, sailors or seamen, who thus signally served their country in its extremity, deserves the special recognition of Congress, and it will be to me an unfeigned pleasure to recommend for each of them a special medal of honor."

It has been urged that service medals be given all officers and men, of the regular and volunteer troops, who honorably served in the war with Spain, in the Philippine Islands, and in China. This is a practice quite general in all other armies and is commended to your thoughtful consideration.

CAMP SITES.

The provisions of the act of Congress approved February 2, 1901, have all been practically carried into effect, save section 35, which authorizes:

Preliminary examinations and surveys to be made for the purpose of selecting four sites with a view to the establishment of permanent camp grounds for instruction of troops of the Regular Army and National Guard, with estimates of the cost of the sites and their equipment with all modern appliances, and for this purpose the Secretary of War is authorized to detail such officers of the Army as may be necessary to carry on the preliminary work; and the sum of ten thousand dollars is hereby appropriated for the necessary expense of such work, to be disbursed under the direction of the Secretary of War.

This is now before the Secretary of War, and will doubtless receive the early consideration which the importance of the question demands.

Respectfully submitted.

H. C. CORBIN,
Adjutant-General,
Major-General, U. S. A.

The LIEUTENANT-GENERAL COMMANDING THE ARMY.

Ordnance Det.	6	4					10	0	181		
Signal Corps	1	11	1				1	2	15		1
Record and I.											
Chaplains											
Total	1	65	6	5	5		1	61	94	1,437	8
First United	3			1		1		2	33	235	2
Second Unit	8	1	1					7	17	317	
Third United	27	2	4	3				4	11	214	12
Fourth Unit	24	1	3					2	28	324	13
Fifth United	11	1	2	1				4	67	356	
Sixth United	2	8	2	1	1			4	37	252	8
Seventh Unit	7	2	1					3	10	275	
Eighth Unit	2		1	1	1			3	81	331	
Ninth United	1	8	2	1			1	3	9	301	9
Tenth United	6	2	5	1				5	8	312	
Eleventh Unit									78	109	
Twelfth Unit									44	58	
Thirteenth U									2	2	
Fourteenth U	3								85	108	
Fifteenth Un	2			2					52	65	
Total	3	109	13	20	9	2	1	37	562	3,259	44
Artillery corp	4	48	9	29	2	1		40	692	3,616	11
First United	15	2	4					3	84	278	10
Second Unit	13		2	1	1			9	63	274	8
Third United	27	1	1	1	1	1		2	9	283	7
Fourth Unit	15	1	2	1	5			4	26	226	
Fifth United	1	12	3		1	1		5	98	304	6
Sixth United		28				2		6	2	199	1
Seventh Unit	2		2	1				6	42	227	
Eighth Unit	10	1						5	105	315	2
Ninth United	3	43						3	19	338	7
Tenth United		7	2		1	1		6	60	246	
Eleventh Unit		4						7	74	329	
Twelfth Unit	1	18	1		1	1	1	1	11	295	10
Thirteenth U		20			4	1		1	1	196	
Fourteenth U	13	21		1				8	60	415	79
Fifteenth U	1	15				1		2	85	326	18
Sixteenth U		22	2	2		3	1	3		219	1
Seventeenth		35	1	2		2		5		279	4
Eighteenth U		41	1	1	2	1		4	41	362	9
Nineteenth U		34	1		1	1		6	4	217	1
Twentieth U		11		4	1	1	2	5	13	309	2
Twenty-first	2	38		4				2	6	269	2
Twenty-second	1	19	2	3		1			4	207	4
Twenty-third	2	15		1		1		6	49	285	
Twenty-fourth		26	1	3	1	1	1	15	1	254	1
Twenty-fifth	1	23	1	4		3		7	7	233	8
Twenty-sixth		5		1					41	63	4
Twenty-seve		2		1		1			61	70	
Twenty-eigh		4		1	1	1			45	56	
Twenty-nint		2							117	128	
Thirtieth Un		4							27	36	
Total	25	531	23	43	18	30	6	121	1,155	7,237	282
West Point d								3		89	
Indian scout										36	
Electrician s										5	
Recruits at r		17	1	2	1	1		13	607	1,129	
Total		17	1	2	1	1		16	607	1,259	
Grand	33	770	52	99	35	31	8	275	3,110	16,808	345

ADJUTANT

H. C. CORBIN,
Adjutant-General, Major-General, U. S. A.

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JUNE 30, 1901.

	1901.		June, 1901.	
	Enlisted men.	Officers.	Enlisted men.	Remarks.
Department	4,852	162	4,834	The departments in Cuba were consolidated Nov. 15, 1900. G. O., 131. A. G. O., Oct. 29, 1900.
Division of	51,766	1,404	48,779	Discontinued and merged into the "Department of the East" Dec. 15, 1900. G. O., 133. A. G. O., Nov. 9, 1900. The strength shown from December, 1900, is of the "District of Porto Rico."
Department	1,521	22	663	
China relief	160	5	160	Discontinued May 19, 1901. G. O., 20. China relief expedition, May 11, 1901. One company remained at Peking as legation guard.
Department	1,001	28	991	Troops in the "District of Porto Rico" are not included.
Alaska	2,616	231	4,954	
Califort	899	37	884	
The Col	868	39	1,464	
The Col	814	27	1,129	
Dakota	8,348	311	9,432	
The Est	2,508	75	2,613	
The Lal	2,144	106	2,207	
The Mh	1,201	52	1,360	
Texas	10,943	791	2,187	
Miscellaneous				
Total	89,641	3,290	81,657	

ADJUTANT
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H. C. CORBIN,
Adjutant-General, Major-General, U. S. A.



ETWEEN JULY 1, 1900, AND JUNE 30, 1901.

ENLISTED MEN.										WOUNDED.		
Of wounds.	Died.							Total.	Officers.	Enlisted men.		
	Disease.	Accident.	Drowned.	Suicide.	Murder or homicide.	Retired.	Missing.				Deserted.	
July, 1900.....	2	82	5	7	3	2	31	1	330	1,418	6	82
August, 1900....	14	84	2	5	1	3	32		360	1,601	2	101
September, 1900	4	85	1	34	2	2	22	1	367	1,665		27
October, 1900....	2	77		3	6	3	16	4	290	1,504		20
November, 1900	2	62	4	5	2	2	39	1	214	1,437	1	21
December, 1900	5	71	6	9	3	2	13	1	149	1,362		17
January, 1901....		48	5	1	1	2	23		131	1,515		10
February, 1901..	2	39	11	4	4	7	18		213	1,187		19
March, 1901.....	2	55	6	3	2	4	18		165	1,577		11
April, 1901.....		49	6	11	6	3	27		268	1,367	1	10
May, 1901.....		54	6	6	4	3	16		269	998	1	12
June, 1901.....		64		9	1	1	20		354	1,177	2	15
Total.....	33	770	52	99	35	34	275	8	3,110	16,808	13	345
July, 1900.....	2	96	1	1		5		2	7	205	1	46
August, 1900....		96	3	7	1	2		1	3	196	3	38
September, 1900	4	72	2	3	1	4		1	9	220	7	33
October, 1900....		73	1	5		2		6	7	356	1	54
November, 1900	3	72	2	3	2	4			10	527	4	33
December, 1900	4	68	2		1	1		1	4	453	1	32
January, 1901..	2	38	2		2			2	9	1,161	2	33
February, 1901..	1	35		2	1	1			3	1,141		9
March, 1901.....		27	1	5	5			2	3	1,526	1	7
April, 1901.....	1	19	1		1	1			2	768		2
May, 1901.....		13		1						1,126		
June, 1901.....		15								97		
Total.....	17	624	15	27	14	20		15	57	7,776	20	287
Grand total	50	1,394	67	126	49	54	275	23	3,167	24,584	33	632

The last of the Volunteer force was mustered out July 5, 1901.

H. C. CORBIN,
Adjutant-General, Major-General, U. S. A.

ADJUTANT-*G*

WAR

D.—TABLE MARCH 2, 1899, WITH LOSSES FROM ALL CAUSES AS

Unit	Transport.	Arrived at San Francisco, Cal.	Mustered out.	Where.
Eleventh Unit	Meade	Mar. 1, 1901	Mar. 13, 1901	San Francisco, Cal.
Twenty-sixth	Garonne	Apr. 20, 1901	May 13, 1901	Do.
Twenty-seventh	Buford	Mar. 13, 1901	Apr. 1, 1901	Do.
Twenty-eighth	Thomas	Apr. 14, 1901	May 1, 1901	Do.
Twenty-ninth	Grant	Apr. 19, 1901	May 10, 1901	Do.
Thirtieth Unit	Hancock	Mar. 12, 1901	Apr. 3, 1901	Do.
Thirty-first Unit	do	June 9, 1901	June 18, 1901	Do.
Thirty-second	Grant	Apr. 19, 1901	May 8, 1901	Do.
Thirty-third Unit	Logan	Mar. 29, 1901	Apr. 17, 1901	Do.
Thirty-fourth	do	do	do	Do.
Thirty-fifth Unit	Thomas and Rose- crans	Apr. 14-18, 01	May 2, 1901	Do.
Thirty-sixth Unit	Pennsylvania	Mar. 2, 1901	Mar. 16, 1901	Do.
Thirty-seventh	Sheridan	Feb. 6, 1901	Feb. 20, 1901	Do.
Thirty-eighth	Logan	June 25, 1901	June 30, 1901	Do.
Thirty-ninth Unit	Lawton	Apr. 17, 1901	May 6, 1901	Do.
Fortieth Unit	Pennsylvania	June 17, 1901	June 24, 1901	Do.
Forty-first Unit	Buford	June 26, 1901	July 3, 1901	Do.
Forty-second Unit	Ohio ¹	June 21, 1901	June 27, 1901	Do.
Forty-third Unit	Kilpatrick	June 27, 1901	July 5, 1901	Do.
Forty-fourth Unit	Logan	June 25, 1901	June 30, 1901	Do.
Forty-fifth Unit	Sheridan	May 17, 1901	June 3, 1901	Do.
Forty-sixth Unit	do	do	May 31, 1901	Do.
Forty-seventh	Thomas	June 26, 1901	July 2, 1901	Do.
Forty-eighth Unit	Grant	June 24, 1901	June 30, 1901	Do.
Forty-ninth Unit	Thomas and Grant	June 26, 1901 June 24, 1901	do	Do.
Porto Rico Regt			do	San Juan, P. R.
Squadron Phil			do	Manila, P. I.

¹ Co. H (transport Aztec) sailed May 18 and arrived at San Francisco June 19, 1901. Mustered out June 24, 1901.

² Co. B (transport Kintuck) sailed May 26 and arrived at Port Townsend, Wash., June 29 and at San Francisco, Cal., July 3, 1901. Mustered out July 8, 1901.

³ Co. G sailed from San Francisco, Cal., Nov. 20 and arrived at Manila, P. I., Dec. 7, 1899.

D (Continued) THE ACT OF MARCH 2, 1899, WITH LOSSES FROM ALL

	MEN.							WOUNDED.	
	Died.						Total.		
	Accident.	Drowned.	Suicide.	Murder or homicide.	Misling.	Deserted.		Officers.	Enlisted men.
General officers								3	
Eleventh Cavalry	1	4	1	3	1	28	509	4	35
Squadron Phillips								1	
Total	1	4	1	3	1	28	509	5	35
Twenty-sixth Inf				6		84	598		34
Twenty-seventh Inf	4	1	1	1	2	99	640	1	12
Twenty-eighth Inf		7		1		140	634	2	30
Twenty-ninth Inf	2		2	3	2	41	603	2	18
Thirtieth Infan	1	3	1	1	8	17	674	2	30
Thirty-first Inf		2		1		33	446		
Thirty-second Inf		1	1	2	1	38	785	1	13
Thirty-third Inf		2	1	1	3	27	606	4	88
Thirty-fourth Inf	4	5	1	1	3	22	592	2	28
Thirty-fifth Inf	1		4		8	38	641	3	21
Thirty-sixth Inf		1	2	2		18	421	7	30
Thirty-seventh Inf		3	1		1	22	438	3	37
Thirty-eighth Inf	1	2		2		33	645	2	26
Thirty-ninth Inf	2	1	1	1	1	34	840	3	28
Fortieth Infan	1	1		3		43	569	4	56
Forty-first Infan		4				110	667		3
Forty-second Inf	1		2	1		50	626	1	5
Forty-third Inf	3	2		1	1	77	488	4	62
Forty-fourth Inf	2			2	2	17	360	4	35
Forty-fifth Inf	2	1			2	39	583	1	24
Forty-sixth Inf	1			1		51	689	1	14
Forty-seventh Inf	2	2				109	589	3	62
Forty-eighth Inf		6	1			9	277		4
Forty-ninth Inf	2	5		7	2	9	490		9
Porto Rico Regt	2		5	1		3	158		
Total	31	49	23	38	36	1,163	14,094	50	669
Grand total	32	53	24	41	37	1,191	14,603	58	704

Of these 1 Spain.

ADJUTANT-GENERAL
Washington

H. C. CORBIN.
Adjutant-General, Major-General, U. S. A.

WAITE

E.—Deaths in the armies of the United States between July 1, 1900, and June 30, 1901.

Country.	Killed.		Died of wounds.		Disease.		Accident.		Drowned.		Suicide.		Murder or homicide.		Total.	
	Officers.	Enlisted men.	Officers.	Enlisted men.	Officers.	Enlisted men.	Officers.	Enlisted men.	Officers.	Enlisted men.	Officers.	Enlisted men.	Officers.	Enlisted men.	Officers.	Enlisted men.
REGULARS.																
United States					7	174		13		36		10		4	7	237
Cuba					3	48		5		6		4		1	3	64
Alaska						3		1		2		1				7
Porto Rico						5										5
Hawaiian Islands				1												1
Philippine Islands	9	75	1	14	9	445		32		51		18	1	29	20	664
China	2	31		18	1	46		1		1		2			3	99
Japan						10				1						11
At sea						39				2						41
Total	a 11	106	1	33	a 20	770		52		99		35	1	34	33	1,129
VOLUNTEERS.																
United States			1		3	99						1			4	100
Cuba					3										3	
Porto Rico					1	9									1	13
Hawaiian Islands					1	4						4			1	4
Philippine Islands	6	87	1	17	6	439	4	15	1	26		7		20	18	611
Japan					1	2									1	2
At sea						71				1		2				74
Total	a 6	87	2	17	a 15	624	4	15	1	27		14		20	28	804
Grand total	a 16	193	3	50	a 32	1,394	4	67	1	126		49	1	54	a 57	1,933

a Four officers of the Regular Army who died also held commissions in the volunteer forces, in which they are included, and are, to avoid counting twice, deducted from the aggregate.

H. C. CORBIN,
Adjutant-General, Major-General, U. S. A.

ADJUTANT-GENERAL'S OFFICE,
Washington, D. C., October 1, 1901.

REPORT OF THE SECRETARY OF WAR.

F.—Dates of sailing and troops sent to Philippine Islands.

[Maj. Gen. Adna R. Chaffee relieved Genera. MacArthur in command of the Division of the Philippines July 4, 1901. At the date of last report there had been forwarded to the Philippines 3,191 officers and 96,412 enlisted men. Since that time transports carrying troops have left as herein indicated.]

Date of sailing.	Transport.	Commanding officer.	Command.	Strength.		Date of arrival in Manila.
				Officers.	Enlisted men.	
1900.						
Oct. 10	Leclayna	Maj. Thomas Cruise, Q. M. Vols.	Det. with 15 horses and 236 mules.	1	4	1900. Nov. 20
Oct. 13	Wyfield		Civilian employees with 135 mules.			Nov. 21
Oct. 16	Grant	Capt. E. Du Bois, 42d Inf.	Det. off., Hosp. Corps, Sig. Corps, and recruits	6	615	Nov. 12
Oct. 18	Coumaugh	First Lieut. F. L. Smith, 39th Inf.	Det. with 102 horses and 180 mules.	1	1	Nov. 27
Nov. 1	Sheridan	Capt. D. F. Alington, 12th Inf.	Det. off. and recruits.	8	282	Nov. 28
Nov. 7	Buport (from New York City).	Col. Jacob Kline, 21st Inf.	Det. off., Hosp. Corps, and recruits.	23	944	Dec. 29
Nov. 13	Kilpatrick (from New York City).	Col. Tully McCrea, Artillery Corps.	do	22	930	1901. Jan. 4
Nov. 16	Sheridan	Maj. C. L. Hodges, 17th Inf.	Det. off., Hosp. Corps, Sig. Corps, and recruits.	4	341	1900. Dec. 15
Dec. 1	Meade	Lieut. Col. J. K. Campbell, 30th Inf.	Det. off., Hosp. Corps, recruits, etc.	5	232	Dec. 31
Do.	Artec	First Lieut. J. M. Graham, 19th Inf.	Civilian employees with animals	1		1901. Jan. 6
Dec. 15	Logan	Capt. Warren H. Cowles, 4th Inf.	Det. off., Hosp. Corps, Sig. Corps, and recruits.	3	126	Jan. 10
Do.	Kintuck (from Seattle, Wash.).	Capt. K. J. Hampton, A. Q. M. Vols.	Animals and supplies	1	1	Jan. 23
Do.	Thomas.	Capt. W. M. Coulling, A. Q. M. Vols.		4	1	Jan. 18
1901.						
Jan. 1	Hancock	Capt. H. C. Keene, Jr., 24th Inf.	Det. off., Sig. Corps, and recruits	2	87	Jan. 27
Do.	Thyra (from Portland, Oreg.)	Capt. W. H. Gordon, 18th Inf.	Det. with stores.	1	12	Feb. 11
Jan. 16	Grant	Capt. J. M. Baker, A. Q. M. Vols.	Det. Hosp. Corps, Sig. Corps, recruits, etc.	1	106	Feb. 12
Feb. 1	Lawton	Capt. W. C. Cannon, Q. M.	Det. off., Hosp. Corps, recruits, etc.	3	106	Mar. 1
Feb. 16	Sheridan	Capt. J. H. H. Feshine, 18th Inf.	1 Batt. 25th Inf., 1 Batt. 27th Inf., recruits, etc.	9	1,308	Mar. 19
Mar. 15	Indiana	Maj. R. F. Yeaman, 23d Inf.	D. 10th Inf.; A. B. C. D. 24th Inf.; Det. Hosp. Corps, etc.	9	740	Apr. 16
Mar. 18	Meade	Col. W. A. Ranfery, 5th Cav.	Hdqrs., A. B. C. D. I. K. L. M. 5th Cav.; A. B. 15th Cav.; Det. Hosp. Corps, etc.	26	920	Apr. 17
Mar. 18	Pennsylvania.	Maj. W. T. Duggan, 10th Inf.	B. C. I. K. L. M. 10th Inf.	17	806	Apr. 16
Mar. 20	Packing (from Portland, Oreg.)	Second Lieut. W. S. Valentine, 5th Cav.	Det. off., and enlisted men	2	107	Apr. 17
Do.	Kintuck		Det. with horses and supplies	2	1	Apr. 26
Mar. 25	Hancock	Lieut. Col. L. H. Rucker, 6th Cav.	E. F. G. H. 6th Cav. C. D. H. M. 7th Inf.	22	809	Apr. 19
Apr. 1	Bulford	Lieut. Col. A. H. Bowman, 5th Inf.	C. D. 15th Cav. E. F. G. H. 5th Inf.	12	804	May 2
Apr. 5	Kilpatrick	Col. I. D. Dekusey, 11th Inf.	Hdqrs., I. M. 11th Inf.; K. L. 1st Inf.; A. 10th Inf.; G. 15th Cav.	18	844	May 12

Apr. 6	Artec	First Lieut. A. G. Nimsen, 6th Cav.	Det. with horses and mules.	2	1	May 8
Apr. 16	Logan	Lieut. Col. C. L. Davis, 11th Inf.	I, K, L, M, 9th Cav.; E, F, G, H, 10th Cav.; I, M, 1st Inf.	28	1,496	May 14
Apr. 16	Ohio	Lieut. Col. L. A. Matile, 15th Inf.	A, B, C, D, 8th Inf.	9	708	May 10
Do...	Thyra	First Lieut. J. C. Raymond, 6th Cav.	Det. with 845 horses	2	188	May 18
Apr. 20	Thomas	Capt. R. H. Lane, Marine Corps	Det. of recruits, etc.	4	157	May 20
Apr. 26	Grant	Capt. J. M. Baker, A. Q. M. Vols	Det. off., Hosp. Corps, etc.	9	24	May 23
May 25	Lawton	Maj. J. E. MacIn, 11th Inf.	K, L, 11th Inf.; Det. Sig. Corps and Hosp. Corps	12	274	June 23
June 1	Sheridan	First Lieut. W. H. McCormack, 9th Cav.	Det. Hosp. Corps, recruits, etc.	17	249	June 28
June 25	Bancroft	Capt. H. Jervoy, Engr. Corps	E, F, G, H, Engineers	21	408	July 16
July 10	Buford	First Lieut. C. H. Bridges, 22d Inf.	Det. off., Hosp. Corps, recruits, etc.	12	84	Aug. 17
Do...	McClellan (from New York City)	Capt. F. A. Grant, Q. M.		6	94	Sept. 9
July 16	Grant	Capt. J. M. Baker, Q. M.	Det. off. and enlisted men	28	49	Aug. 13
Aug. 16	Kilpatrick	Capt. C. R. Tyler, 19th Inf.	do	13	97	Sept. 7
Aug. 16	Meade	Capt. O. R. Wolfe, 22d Inf.	Det. off., recruits, etc.	7	102	Sept. 17
Aug. 22	Inghalls (from New York City)		Det. Hosp. Corps	4	26	Oct. 10
Aug. 31	Sheridan	Capt. P. L. Miles, Q. M.		14		Sept. 26
Sept. 12	Sumner	Capt. C. T. Baker, Q. M.		6		
Sept. 16	Warren	Capt. W. C. Cannon, Q. M.		9	2	
	Total			404	14,260	

Transports sailed from San Francisco, Cal., unless otherwise indicated.

Total number of troops that served in the Philippines between June 30, 1898 (date of first arrival of United States troops), to June 30, 1901.

	Officers.	Enlisted men.
Regulars.....	1,342	60,933
Volunteers.....	2,135	47,867
Total.....	3,477	108,800

Casualties from all causes in the Philippines during the above period.

	Regulars.		Volunteers.		Total.		Aggregate.
	Officers.	Enlisted men.	Officers.	Enlisted men.	Officers.	Enlisted men.	
Killed.....	28	261	22	388	50	649	699
Of wounds.....	6	78	6	129	12	207	219
Disease.....	18	1,082	18	1,028	36	2,110	2,146
Accident.....	1	61	4	38	5	99	104
Drowned.....	1	128	4	61	5	189	194
Suicide.....	2	35	4	15	6	50	56
Murder or homicide.....	1	46	.....	28	1	74	75
Total deaths.....	57	1,691	58	1,687	115	3,378	3,493
Wounded.....	49	998	133	1,653	182	2,651	2,828

The "Died of wounds" are included in the "Wounded."

H. C. CORBIN,

Adjutant-General, Major-General, U. S. A.

ADJUTANT-GENERAL'S OFFICE,
Washington, D. C., October 1, 1901.

G.

Retirements, resignations, deaths, etc., among officers between October 1, 1900, and October 1, 1901.

Name and rank.	Date.	Length of service. ¹
RETIRED.		
Arnold, Abraham K., colonel, Eighth Cavalry	Mar. 24, 1901.....	Yrs. m. d. 46 8 23
Barber, Merritt, colonel, assistant adjutant-general.	June 30, 1901.....	38 5 12
Barlow, John W., brigadier-general, chief of engineers.	May 3, 1901.....	44 10 2
Barr, Thomas F., brigadier-general, judge-advocate-general.	May 22, 1901.....	36 1 9
Bell, James M., brigadier-general.....	Oct. 1, 1901.....	37 0 4
Boyle, William H., lieutenant-colonel, Nineteenth Infantry.	Nov. 13, 1900.....	37 5 3
Brinkerhoff, Henry R., lieutenant-colonel, Sixth Infantry.	Oct. 9, 1900.....	37 6 6
Byrne, Charles C., colonel, assistant surgeon-general.	May 7, 1901.....	40 10 10
Chambliss, Nathaniel R., second lieutenant, Eighth Infantry.	Feb. 2, 1901 (as first lieutenant).....	6 4 21
Clague, John J., colonel, assistant commissary-general.	Apr. 1, 1901.....	37 6 11
Clark, Hollis C., captain, Twenty-fourth Infantry.	May 13, 1901.....	14 10 12
Clout, John W., brigadier-general, judge-advocate-general.	May 24, 1901.....	44 0 18
Cole, George W., first lieutenant, Seventh Cavalry.	Feb. 2, 1901 (as captain).....	12 3 13
Combs, Richard, colonel, Fifth Infantry.....	July 11, 1901.....	46 5 11
Corlies, Augustus W., colonel, Second Infantry....	Mar. 25, 1901.....	36 10 10
Daggett, Aaron S., brigadier-general.....	Mar. 2, 1901.....	38 10 14
Davis, Wirt, colonel, Third Cavalry.....	Apr. 29, 1901.....	40 11 17
Dempsey, Charles A., colonel, Thirtieth Infantry..	Sept. 27, 1901.....	40 0 6
Dunkelberger, Isaac R., captain of cavalry.....	Mar. 21, 1901.....	9 8 11
Dutton, Clarence E., major, ordnance department.	Feb. 7, 1901.....	38 5 2
Duval, John H., major, commissary of subsistence.	Apr. 8, 1901.....	17 8 14
Egan, Charles P., brigadier-general, commissary-general of subsistence.	Dec. 6, 1900.....	37 0 11
Ellis, Philip H., colonel, Twenty-fourth Infantry..	July 1, 1901.....	37 1 27

¹ Includes cadet, enlisted and commissioned service, to date of retirement.

ADJUTANT-GENERAL.

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G.—Retirements, resignations, deaths, etc., among officers between October 1, 1900, and October 1, 1901—Continued.

Name and rank.	Date.	Length of service.
RETIRED—continued.		
Eakridge, Richard I., colonel, Twenty-seventh Infantry.	July 26, 1901	Yrs. m. d. 37 8 18
Ewers, Ezra P., colonel, Tenth Infantry	Apr. 18, 1901	39 2 25
Freeman, Henry B., brigadier-general	Jan. 17, 1901	40 0 28
Geddes, Andrew, captain of infantry	Jan. 14, 1901	18 3 7
Gilmore, John C., colonel, assistant adjutant-general.	Apr. 18, 1901	37 5 6
Hammond, Brant C., chaplain.	Aug. 27, 1901	17 2 0
Hartsuff, Albert, colonel, assistant surgeon-general	Feb. 4, 1901	39 5 6
Hees, Frank W., major, Third Artillery	Dec. 15, 1900	38 8 6
Hewitt, Christian C., captain, Nineteenth Infantry	Feb. 2, 1901 (as major)	30 7 1
Hoyle, George S., captain, First Cavalry	Feb. 2, 1901 (as major)	31 7 1
Ingalls, James M., lieutenant-colonel, Third Artillery.	Jan. 25, 1901	37 0 23
Jackson, Henry, colonel, Third Cavalry	May 31, 1901	36 9 7
Jarvis, Nathan S., captain, assistant surgeon	June 29, 1901	9 8 14
Kendrick, Frederick M. H., major, Seventh Infantry.	Oct. 5, 1900	37 11 6
Kirkman, Joel T., lieutenant-colonel, Eighteenth Infantry.	July 5, 1901	39 4 1
Lee, Fitzhugh, brigadier-general	Mar. 2, 1901	11 8 9
Leele, John G., lieutenant-colonel, Thirtieth Infantry.	Sept. 22, 1901	38 1 23
Lieber, G. Norman, brigadier-general, judge-advocate-general.	May 21, 1901	39 10 6
Lockwood, John A., captain, Fourth Cavalry	Nov. 14, 1900	19 11 18
Loeffler, Charles D. A., captain, military storekeeper, quartermaster department.	Jan. 12, 1901	16 1 15
McGregor, Thomas, colonel, Ninth Cavalry	June 26, 1901	43 2 18
O'Brien, Lyster M., lieutenant-colonel, Seventeenth Infantry.	Dec. 7, 1900	36 8 20
O'Reilly, Thomas P., second lieutenant, Twenty-second Infantry.	Mar. 22, 1901	9 6 28
Pilcher, James E., captain, assistant surgeon	Oct. 31, 1900	16 8 9
Poindexter, Jefferson D., captain, assistant surgeon	Apr. 13, 1901 (as major)	14 7 14
Reynolds, William B., captain, Fourteenth Infantry.	Apr. 16, 1901 (as major)	25 7 15
Robert, Henry M., brigadier-general, Chief of Engineers.	May 2, 1901	47 10 1
Rogers, Robert M., captain, Artillery Corps.	Feb. 2, 1901 (as major)	39 3 13
Schwan, Theodore, brigadier-general	Feb. 21, 1901	43 8 9
Scully, James W., colonel, assistant quartermaster-general.	Nov. 1, 1900	42 11 10
Smoke, Samuel A., captain, Fifth Infantry	Mar. 21, 1901	17 8 20
Sparrow, Solomon E., captain, Twenty-first Infantry.	Oct. 31, 1900	26 2 0
Thompson, Charles B., captain, assistant quartermaster.	Feb. 2, 1901 (as major)	24 0 12
Turner, William J., major, Sixth Infantry	Dec. 5, 1900	27 10 6
Van Ness, William P., captain, Artillery Corps	Feb. 2, 1901 (as major)	33 4 2
Volkmar, Walter S., first lieutenant, Artillery Corps.	Sept. 21, 1901	5 1 2
Wessells, Henry W., jr., colonel of cavalry	Feb. 19, 1901	35 11 18
Wham, Joseph W., major, paymaster	May 8, 1901	32 2 26
Wheeler, Fred, captain, Fourth Cavalry	Feb. 28, 1901 (as major)	26 7 27
Whipple, Charles W., captain, Ordnance Department.	Feb. 2, 1901 (as major)	36 7 1
Wilson, Charles I., colonel, assistant paymaster-general.	May 3, 1901	35 6 8
Wilson, James H., brigadier-general.	Mar. 2, 1901	18 3 17
Wilson, John M., brigadier-general, Chief of Engineers.	Apr. 30, 1901	45 8 1
Winston, Edward T., captain, Nineteenth Infantry.	Sept. 24, 1901	17 3 9
Wolf, Louis C., first lieutenant, Corps of Engineers.	June 29, 1901	8 0 8
Woodhull, Alfred A., colonel, assistant surgeon-general.	Apr. 13, 1901	39 6 22
WHOLLY RETIRED.		
Perkins, Edward W., first lieutenant, Eighth Infantry.	Jan. 29, 1901	
RESIGNED.		
Barker, Alvin A., captain, quartermaster.	July 8, 1901	
Brookfield, Robert M., first lieutenant, Eleventh Infantry.	Oct. 15, 1900	
Bunnell, George W., jr., second lieutenant, Artillery Corps.	Feb. 15, 1901	
Campbell, Harry R., first lieutenant, Fourth Infantry.	Mar. 19, 1901	
de Beaumont, Adrian V. L. R., second lieutenant, Eighth Infantry.	Mar. 26, 1901	
Goodnow, Harold P., second lieutenant, Eighth Infantry.	May 11, 1901	

G.—Retirements, resignations, deaths, etc., among officers between October 1, 1900, and October 1, 1901—Continued.

Name and rank.	Date.	Length of service.
RESIGNED—continued.		
Lieber, William A., first lieutenant, Twenty-fourth Infantry.	May 20, 1901	Yrs. m. d.
Mannion, James W. B., second lieutenant, Thirtieth Infantry.	Sept. 3, 1901	
Palmer, Charles D., captain, quartermaster.	Feb. 4, 1901	
Pilchard, Sewell N., chaplain.	Nov. 8, 1900	
Pruden, Octavius L., captain, paymaster.	July 1, 1901	
Putnam, Israel, second lieutenant, Sixth Infantry.	Nov. 2, 1900	
Richards, William E., captain, assistant surgeon.	Feb. 8, 1901	
Smith, Ernest G., second lieutenant, Seventeenth Infantry.	Mar. 11, 1901	
Stewart, Walter E., jr., second lieutenant, Third Infantry.	Jan. 31, 1901	
Strong, Putnam B., captain, quartermaster.	July 15, 1901	
HONORABLY DISCHARGED.		
Wright, William O., jr., second lieutenant, Nineteenth Infantry.	May 13, 1901	
DISMISSED.		
Schwenck, Samuel K., captain, retired	Mar. 20, 1901	
DEATHS—OFFICERS ON THE ACTIVE LIST.		
Almy, William E., captain, Fifth Cavalry (major, Porto Rico Provisional Regiment of Infantry).	Aug. 1, 1901, San Juan, P. R.	
Booth, Charles A., major, quartermaster.	Nov. 14, 1900, Louisville, Ky.	
Bumpus, Edward A., first lieutenant, Ninth Infantry.	Sept. 28, 1901, killed in action at Balangiga, P. I.	
Connell, Thomas W., captain, Ninth Infantry	Sept. 28, 1901, killed in action at Balangiga, P. I.	
Crockett, Allen T., second lieutenant, Twenty-first Infantry.	Sept. 24, 1901, killed in action near Candelaria, P. I.	
Downes, Edward E., first lieutenant, First Infantry.	June 23, 1901, killed in action near Salcedo, Samar, P. I.	
Hall, William R., major, surgeon	Apr. 2, 1901, Manila, P. I.	
Keller, Charles, colonel Twenty-third Infantry	Apr. 22, 1901, Fort Sam Houston, Tex.	
Lancaster, James M., lieutenant-colonel Third Artillery.	Oct. 6, 1900, Fort Monroe, Va.	
Lee, Walter H., second lieutenant, Engineer Corps.	June 10, 1901, killed in action near Lipa, P. I.	
Ludlow, William, brigadier-general	Aug. 30, 1901, Convent Station, N. J.	
McClure, Charles, jr., first lieutenant, Thirtieth Infantry.	July 1, 1901, Catbalogan, P. I.	
Michie, Peter S., professor, United States Military Academy.	Feb. 16, 1901, West Point, N. Y.	
Michler, Francis, major, Fifth Cavalry	May 29, 1901, Washington, D. C.	
Morrison, John, jr., first lieutenant, Fourth Cavalry.	Jan. 18, 1901, killed in action near Gapan, P. I.	
Murray, William H., captain of Infantry	Mar. 23, 1901, Manila, P. I.	
Paddock, Richard B., captain, Sixth Cavalry	Mar. 9, 1901, Peking, China.	
Parker, Montgomery D., captain, Eighth Infantry.	Dec. 17, 1900, Manila, P. I.	
Pasco, William D., second lieutenant, Eighteenth Infantry.	Oct. 29, 1900, killed in action, Cuartero, P. I.	
Peterson, Matt R., captain, commissary of subsistence (major, commissary of subsistence, United States Volunteers).	Oct. 17, 1900, Habana, Cuba	
Ramsay, Charles R., first lieutenant, Twenty-first Infantry.	July 13, 1901, Manila, P. I., of wound received in action near Lipa, P. I., June 10, 1901.	
Schofield, Charles B., captain, Second Cavalry	Feb. 2, 1901, Mantanzas, Cuba.	
Smith, Louis P., first lieutenant, assistant surgeon.	Jan. 8, 1901, Manila, P. I.	
Smith, Sebree, captain, Artillery Corps	July 6, 1901, Catonsville, Md.	
Springer, Anton, captain, First Infantry	June 10, 1901, killed in action near Lipa, P. I.	
Tesson, Louis S., major, surgeon	June 7, 1901, Vancouver Barracks, Wash.	
Wilhelm, William H., captain, Twenty-first Infantry.	June 12, 1901, Lipa, P. I., of wounds received in action near Lipa, P. I., June 10, 1901.	
Wood, Palmer G., jr., second lieutenant, Twelfth Infantry.	Nov. 16, 1900, San Juan de Guimba, P. I.	
Wright, Joseph P., colonel, assistant surgeon-general.	Oct. 8, 1900, Washington, D. C.	
DEATHS, OFFICERS ON THE RETIRED LIST.		
Bartlett, Charles G., colonel	June 14, 1901, New York, N. Y.	
Batchelder, Richard N., brigadier-general	Jan. 4, 1901, Washington, D. C.	
Belcher, John H., major	Apr. 16, 1901, Boston, Mass.	
Brooke, Benjamin, captain	Oct. 18, 1900, Radnor, Pa.	
Bryant, Montgomery, colonel	June 17, 1901, Wichita, Kans.	
Clarke, Charles E., captain	Feb. 1, 1901, New Rochelle, N. Y.	

G.—Retirements, resignations, deaths, etc., among officers between October 1, 1900, and October 1, 1901—Continued.

Name and rank.	Date.	Length of service.
DEATHS, OFFICERS ON THE RETIRED LIST—cont'd.		
Converse, Oscar I., first lieutenant.....	Apr. 23, 1901, Richford, Vt.....	<i>Irs. m. d.</i>
Cushing, Samuel T., brigadier-general.....	July 21, 1901, Washington, D. C.....	
Douglas, William O., first lieutenant.....	Aug. 16, 1901, Binghamton, N. Y.....	
Du Barry, Beekman, brigadier-general.....	Jan. 12, 1901, Washington, D. C.....	
Everts, Edward, major.....	May 17, 1901, Alameda, Cal.....	
Gardner, Hezekiah, captain.....	Apr. 25, 1901, Hammondsport, N. Y.....	
Gregg, Thomas J., captain.....	Dec. 31, 1900, Hueneme, Cal.....	
Hatch, John P., colonel.....	Apr. 12, 1901, New York, N. Y.....	
Hoppy, Edward, first lieutenant.....	Jan. 1, 1901, Westchester, Pa.....	
Irwin, David A., captain.....	Feb. 23, 1901, Orchard Lake, Mich.....	
Krause, William, captain.....	Jan. 24, 1901, Philadelphia, Pa.....	
McClure, Daniel, colonel.....	Oct. 31, 1900, Louisville, Ky.....	
McDonald, Robert, captain.....	May 20, 1901, San Francisco, Cal.....	
Macfeely, Robert, brigadier-general.....	Feb. 21, 1901, Washington, D. C.....	
McGonnigle, Andrew J., major.....	Jan. 25, 1901, Asheville, N. C.....	
McKeever, Chauncey, colonel.....	Sept. 4, 1901, Bad Reichenhall, Ger- many.....	
McNutt, Albert S., first lieutenant.....	May 8, 1901, Washington, D. C.....	
Manning, William C., major.....	May 5, 1901, Washington, D. C.....	
Massey, Solon F., first lieutenant.....	July 12, 1901, Manila, P. I.....	
Norwood, Randolph, captain.....	May 24, 1901, Blue Ridge, Pa.....	
Nugent, Robert, major.....	June 20, 1901, Brooklyn, N. Y.....	
Palmer, George H., major.....	Apr. 7, 1901, near Harrison, Ill.....	
Parke, John G., colonel.....	Dec. 16, 1900, Washington, D. C.....	
Pollock, Robert, captain.....	Feb. 24, 1901, Cornelius, Oreg.....	
Porter, Alexander S., captain.....	Jan. 6, 1901, Redlands, Cal.....	
Porter, Fitz-John, colonel.....	May 21, 1901, Morristown, N. J.....	
Potter, James B. M., lieutenant-colonel.....	Nov. 13, 1900, Kingston, R. I.....	
Smith, Thomas M. K., lieutenant-colonel.....	Mar. 3, 1901, Portland, Oreg.....	
Sweeney, Henry, captain.....	Dec. 9, 1900, San Diego, Cal.....	
Taylor, Rodney M., captain.....	Nov. 5, 1900, Buffalo, N. Y.....	
Thompson, Charles B., major.....	Aug. 26, 1901, Washington, D. C.....	
Van Vleet, Stewart, colonel.....	Mar. 28, 1901, Washington, D. C.....	
Volkmar, William J., colonel.....	Mar. 4, 1901, Pasadena, Cal.....	
Walcott, William H., captain.....	Aug. 30, 1901, Washington, D. C.....	
Ward, G. S. Luttrell, captain.....	Apr. 21, 1901, New Brighton, N. Y.....	
Whittemore, Edward W., lieutenant-colonel.....	Jan. 6, 1901, Los Angeles, Cal.....	
Williams, Robert, brigadier-general.....	Aug. 24, 1901, Plainfield, N. J.....	
Wilson, Thomas, colonel.....	May 30, 1901, New York, N. Y.....	
DEATHS, OFFICERS OF THE U. S. VOLUNTEERS.		
Blakeman, Robert, first lieutenant, Forty-ninth Infantry.....	Oct. 3, 1900, Manila, P. I.....	
Cobb, Thomas M., jr., first lieutenant, Thirty- ninth Infantry.....	Apr. 15, 1901, Honolulu, H. I.....	
Davis, John G., major, surgeon.....	Nov. 1, 1900, Manila, P. I.....	
Febiger, George Lea, first lieutenant, Thirty-third Infantry.....	Oct. 24, 1900, killed in action near Narvacan, P. I.....	
Gavett, Elmer B., second lieutenant, Thirty-ninth Infantry.....	Apr. 19, 1901, Detroit, Mich.....	
Griswold, Richard S., major, surgeon.....	Sept. 23, 1901, killed in action at Ba- lingiga, P. I.....	
Hincken, Elias J., second lieutenant, Forty-fourth Infantry.....	Jan. 29, 1901, killed in action, Santa Lucia, P. I.....	
Kennedy, John, second lieutenant, signal officer..	Nov. 24, 1900, Manila, P. I.....	
Koontz, Howard M., first lieutenant, Forty- fourth Infantry.....	Oct. 30, 1900, killed in action Buga- son, P. I.....	
Monaghan, William, major, paymaster.....	Apr. 13, 1901, Manila, P. I.....	
Moret, Gustave, first lieutenant, assistant surgeon, Porto Rico regiment.....	Mar. 3, 1901, Cayey, P. R.....	
Page, Fred M., captain, Porto Rico regimr.....	Oct. 26, 1900, Habana, Cuba.....	
Polk, Frank M., second lieutenant, Thirty-ninth Infantry.....	Apr. 29, 1901, San Francisco, Cal.....	
Slack, Walter T., first lieutenant, Forty-seventh Infantry.....	Dec. 25, 1900, Manila, P. I.....	
Stuart, Stanley MacC., first lieutenant, assistant surgeon, Eleventh Cavalry.....	Nov. 6, 1900, Santa Cruz, P. I.....	
Sulzer, Raymond, captain, quartermaster.....	Feb. 3, 1901, San Francisco, Cal.....	
DROPPED AS MISSING.		
Brewer, Richard H., first lieutenant, Twenty- seventh Infantry.....	July 13, 1900.....	

H. C. CORBIN.
Adjutant-General, Major-General, U. S. A.

ADJUTANT-GENERAL'S OFFICE,
Washington, D. C., October 1, 1901.

APPENDIX.

GENERAL ORDERS, }
No. 5. }

HEADQUARTERS OF THE ARMY,
ADJUTANT-GENERAL'S OFFICE,
Washington, February 2, 1901.

By direction of the Secretary of War, the following extract from an act of Congress is published for the information and government of all concerned:

AN ACT to increase the efficiency of the permanent military establishment of the United States.

Be it enacted by the Senate and House of Representatives of the United States of America in Congress assembled,

* * * * *
SEC. 38. The sale of, or dealing in, beer, wine or any intoxicating liquors by any person in any post exchange or canteen or army transport or upon any premises used for military purposes by the United States, is hereby prohibited. The Secretary of War is hereby directed to carry the provisions of this section into full force and effect.

* * * * *
Approved, February 2, 1901.

Commanding officers will immediately carry the provisions of this law into full force and effect, and will be held strictly responsible that no exceptions or evasions are permitted within their respective jurisdictions.

Conformably with the foregoing statute, General Orders, No. 46, Headquarters of the Army, Adjutant-General's Office, July 25, 1895, promulgating the post exchange regulations, and all subsequent amendments thereof, are amended so as to read as follows:

POST EXCHANGES.

Post exchanges are established and maintained under special regulations prepared by the War Department. These special regulations will be published and issued from time to time as necessity may demand. (A. R., 325, 1895.)

On June 30 and December 31 of each year the commanding officer of a post at which an exchange is conducted will submit to the Adjutant-General of the Army, through military channels, a detailed report of the operations and financial condition of the exchange, accompanied by such remarks touching its effect upon the welfare of the command as he may deem it necessary to make for the information of the Commanding General of the Army and the Secretary of War; and when no exchange has been maintained at a post such fact will also be communicated to the Adjutant-General of the Army, through military channels, on the dates hereinbefore specified. (A. R., 326, 1895).

1. *Purpose.*—The post exchange will combine the features of reading and recreation rooms, a cooperative store, and a restaurant. Its primary purpose is to supply the troops at reasonable prices with the articles of ordinary use, wear, and consumption not supplied by the Government, and to afford them means of rational recreation and amusement. Its secondary purpose is, through exchange profits, to provide the means for improving the messes.

2. *Buildings.*—At every post where practicable the post commander will institute a post exchange. For this purpose he will set apart any suitable public building or rooms that are available, or will authorize the renting of any private building or part thereof on the reservation (the rental to be paid from the funds of the exchange), or when sufficient exchange funds are available may cause a suitable building to be erected for the purpose; and if a temporary building, or if constructed wholly or in part by the labor of troops, use of the necessary teams and such tools, window sash,

doors, and other material as can be spared by the Quartermaster's Department is authorized; but no permanent structure will be erected on a reservation without first obtaining the authority of the Secretary of War. Expenses of repairs or alterations of public buildings for the use of the exchange will be borne by the exchange when they can not be provided for by the Quartermaster's Department.

3. *Management of business.*—The management of the affairs of the exchange will be conducted by an officer designated "Officer in charge," selected and detailed by the commanding officer. This officer should be fully in sympathy with the purposes of the exchange and possess the business qualifications necessary to its success. He will be assisted by a steward and such other attendants as the business may warrant. In establishing a new exchange, and at posts where the business is small, the steward and attendants may be enlisted men, but, when practicable, civilians will be employed instead in all exchanges whose financial condition will justify the expense, and in selecting them preference will be given to retired enlisted men and honorably discharged soldiers.

4. *The exchange steward.*—The exchange steward, who if an enlisted man should be a noncommissioned officer, should be an accountant, possessing a good knowledge of bookkeeping and commercial customs, of unquestioned integrity, and of sufficient firmness and strength of character to enforce order and discipline about the premises. In the absence of the officer in charge he is in immediate control of the business, and must, therefore, possess the confidence of his superior, both as to his probity and capability. In addition to the records required by the management, he will keep a cashbook, also a blotter, showing, in separate columns, the different articles comprising the stock, and enter therein at the time of sale the quantity or number of articles sold. At the close of each selling day he will prepare a report on a suitable form showing, under appropriate headings, the quantities of the several articles received, sold, and remaining on hand. This report he will submit daily to the officer in charge and at the same time deliver to him the proceeds of the previous day's sales. The report, exhibiting the officer's approval, will be conspicuously posted in one of the exchange rooms during the remainder of the day.

5. *The exchange council.*—The superintendence of the affairs of the exchange will be vested in a council to consist of three officers, one of whom shall be the officer in charge, the others, the two company commanders longest off this duty at the post. Whenever from any cause the council can not be thus organized, it will be constituted in the manner prescribed for a post council of administration. The council may be convened at any time at the call of its president or by direction of the commanding officer, and, subject to the approval of the latter, will designate the articles to be kept for sale, fix the prices at which they shall be sold, and authorize all purchases of supplies. At the end of every month it will meet to take stock, examine the books of the exchange, and inspect the quality of the articles for sale. A statement of the result of the monthly investigation and of the accounts of the officer in charge, showing the receipts and expenditures during the month; also the assets and liabilities will be entered in a book and submitted to the commanding officer for his action. A copy of the statement, with the commanding officer's remarks indorsed thereon, will be exhibited in one of the rooms of the exchange during the ensuing month. Any question not involving pecuniary responsibility upon which the post exchange council and commanding officer may disagree will be submitted for final decision to the department commander.

6. *The subcommittee of noncommissioned officers.*—A subcommittee of noncommissioned officers, one from each company, to be selected by the captain as best fitted to represent the interests of the enlisted men thereof, will be convoked by the commanding officer not less than four times a year. The committee will orally, or in writing, submit to the council its views in respect to the immediate internal operations of the exchange, and recommend any changes that may be desired by the enlisted men, but it is not empowered to criticize the management. Its views and recommendations will be carefully and respectfully considered by the council, whose action thereon will be reviewed by the commanding officer.

7. *Rules of order.*—Rules of order will be prescribed by the officer in charge under the commanding officer. Gambling or playing any game for money or anything of value is forbidden in any exchange. Civilians, other than those employed and resident on the military reservation, will not be permitted to enter the rooms of an exchange without first obtaining the authority of the commanding officer.

8. *First expense of stock and fixtures.*—The expense of fitting up the quarters of the exchange and procuring the necessary articles for the first stock and fixtures may be met by an assessment upon the funds of the several organizations contributing to the institution, or these may be contracted for or procured on credit. When procured on credit, the bills must be paid from the first profits, and it is to be distinctly under-

stood that the officers incurring the debt are responsible for the payment, and not the Government. The Quartermaster's Department is authorized to sell for cash to exchanges at cost, with price of transportation added, such articles of fuel, forage, light, furniture, and fixtures as may be needed and can be spared from stock on hand.

9. *Exchange features.*—An exchange doing its full work should embrace the following sections: (a) A well-stocked general store in which such goods are kept as are usually required at military posts, and as extensive in number and variety as conditions will justify. (b) A well-kept lunch counter supplied with as great a variety of viands as circumstances permit, such as tea, coffee, cocoa, nonalcoholic drinks, soup, fish, cooked and canned meats, sandwiches, pastries, etc. (c) Reading and recreation rooms, supplied with books, periodicals, and other reading matter, billiard and pool tables, bowling alley and facilities for other proper indoor games, as well as apparatus for outdoor sports and exercises, such as cricket, football, baseball, tennis, etc.; a well-equipped gymnasium, possessing also the requisite paraphernalia for outdoor athletics.

10. *Sale of beer, wine, or liquors prohibited.*—The sale of or dealing in beer, wine, or any intoxicating liquors by any person in any post exchange, or canteen, or army transport, or upon any premises used for military purposes by the United States, is prohibited.

11. *Purchase and sale of goods.*—Purchases will ordinarily be made by the officer in charge, or by the steward when so authorized, but articles in considerable quantities will be procured under contract by the officer in charge, with the approval of the council. In no case will orders for goods, however small, be given by the enlisted attendants to the person furnishing them, nor shall the steward or any employee of the exchange have, either directly or indirectly, any personal interest in the purchases, sales or profits, or any advantage of wastage or perquisites of any kind whatever. Whenever contracts or agreements for purchases are made by exchange authorities who by change of station or other cause are removed, such contracts or agreements must be carried out by their successors. The subsistence department is authorized to sell to the exchange at cost price any of the articles composing the ration, and such other articles as may be on hand for sale. But in reselling such goods in small quantities no profit will be charged by the exchange beyond the fractions of cents that are necessary in making change.

12. *Lunch room and price lists.*—In the lunch room prices should be made as low as the cost of the articles, increased by expenses of the attendants, fuel, lights, and waste will permit. Other than this the tariff of prices will be regulated by the circumstances surrounding each exchange. Printed or written price lists will be conspicuously posted in the various sections, and will be corrected when necessary.

13. *Checks or coupons.*—The use of checks or coupons representing values, and exchangeable for merchandise or other charges at the exchange, is *encouraged*, merely. If a man who is not likely to abuse the privilege has money for which he has no particular use on pay day, and desires to avail himself of the opportunity, it is frequently a wise policy to furnish him with a supply of checks; but care should be taken that these checks are not disposed of to unauthorized persons, and to provide against this they should never be redeemed in cash. When permitted by the commanding officer, they should be sold by the officer in charge and regarded as a liability until redeemed.

14. *System of keeping accounts.*—It is not desirable to enforce a particular method of bookkeeping, or impose a special system of accounts upon exchanges. This will be regulated by the exchange officer, whose accounts should be so kept as to be readily understood by the inspecting officers, and to afford the information necessary to render the reports hereinafter prescribed. All business of the exchange must be transacted in its name, and not that of the officer in charge. Invoices, receipted bills, account books, and other papers relating to the business of an exchange pertain to its records, and will not be removed from the post, except in the event of its abandonment, when they will be forwarded to the Adjutant-General of the Army.

15. *Sales on credit.*—When the commanding officer and council are agreed that it is to the true interest of the command, the former may authorize a credit at the exchange to any soldier in good standing to an amount not exceeding one-fifth of his monthly pay. This will be given upon the request of the soldier in writing, approved by his company commander, and these credit checks will be carried on the accounts of the exchanges as "bills receivable" until paid. A man seeking credit privilege will be distinctly informed that credit is given upon the understanding that he must render prompt and unsolicited payment, and only to such men as can be trusted. Defaulters will be immediately debarred the privileges of the exchange, and this under such publicity as will make the act appear disgraceful in the eyes of their comrades.

16. *Operating expenses.*—To secure uniformity in rendering accounts and accuracy in preparing comparative statements, the following are specified as the items that properly enter into the account of operating expenses:

- (a) Compensation of attendants.
- (b) Unavoidable breakage, wastage, destruction, and damage.
- (c) Insurance on merchandise, building, furniture, and fixtures.
- (d) Taxes to which the exchange may be legally liable; licenses, either State, county, or internal revenue.
- (e) The cost of books, blanks, and other stationery; fuel and lights, when not supplied by the Quartermaster's Department; necessary policing about the quarters, when not performed by the regular attendants; express and freight charges on articles that are neither merchandise nor permanent fixtures.

Transportation should not be charged to operating expenses, but added to the cost of the merchandise or fixtures to which it pertains. Repairs to quarters and repairs to and renewals of fixtures should be charged to buildings and fixtures, and not to operating expenses. License to sell tobacco at a post exchange should be taken out in the name of the "Post Exchange at Fort ———," upon the application of the officer in charge, signing himself as "Agent of the Fort ——— Exchange."

17. *Distribution of profits.*—When an exchange is absolutely free from debt, a sum sufficient to cover all anticipated expenses for at least one month will, at the end of each quarter, or oftener if deemed advisable by the council and commanding officer, be taken from the cash on hand and set aside as a reserve fund, and the remainder, which will represent the net profits of the exchange for the period specified, will be disposed of in the following manner: (a) Five per cent will be paid into the regimental fund if a band be serving at the post; (b) Such sum as the council, with the approval of the commanding officer, may determine will be appropriated for the benefit of the entire garrison to all or any of the following purposes: Laying out and preparing and cultivating gardens, and supplying seeds, roots, or plants for the same; the purchase of books, newspapers, periodicals, stationery, etc., for the post exchange or post library; the purchase of gymnastic appliances when there is no gymnasium connected with the exchange; prizes for athletic sports. The expenditure of profits for purposes other than these requires the approval of the Secretary of War. The remaining money may be divided among the organizations contributing to the exchange on such equitable basis as shall be determined by the council, with the approval of the commanding officer. Where differences in this respect arise between the council and commanding officer, the decision of the department commander will be final. The money thus distributed will be paid into the company or detachment funds. In addition to the dividends for the hospital detachment, the proportionate amounts for the sick in hospital who belong to the various companies and detachments that are members of the exchange will be turned over to the surgeon. Any variation from these rules requires the sanction of the Secretary of War.

A division of the cash resources after all debts have been paid will also be made whenever the troops, or any part of them, being members of the exchange, change station; in this event no deduction on account of the reserve fund will be made from the share of the withdrawing troops.

The amount of any loss that an exchange may sustain in consequence of the failure of a soldier to pay for articles properly bought on credit, whether by the desertion of the debtor or by his discharge and virtual repudiation of the debt, will be deducted from the share of the profits of the company or other organization to which the defaulter belongs. Losses by fire or other casualty, death of the debtor, depreciation of value of the fixtures, and deterioration of articles kept for sale, and the accidental breakage of fixtures or other property will be borne by all the participating organizations in common, and should be deducted from the gross receipts before dividing the profits. Credit accounts should be treated as bills receivable until they are settled or found to be a loss, but bills receivable should not be included in the gross amount from which profits are resolved. The amount of cash on hand on the dates specified, after all matured debts are paid, and after setting aside as a reserve fund a sum sufficient to meet anticipated debts for a period not less than one month, constitutes the sum subject to distribution.

18. *Reports.*—The report required by paragraph 326 of the Regulations, showing the financial condition of the exchange, will be made on the blank forms supplied by the Adjutant-General, and will be rendered not later than January 10 and July 10 of each year. The semiannual report will also contain the names and compensation of the civilian employees; the number and extra pay of enlisted attendants, if any; the adequacy and condition of the quarters and the rental therefor, if any.

Whenever the business of a post exchange is from any cause closed a final report of the financial operations of the exchange for the portion of the half year not covered

by previous reports will be rendered to the Adjutant-General of the Army by the officer in charge of the exchange. A similar report will also be rendered when an officer is relieved from the charge of the exchange, and will be accompanied by the certificate of his successor that all the property, including the books and other records, as well as the funds of the establishment, have been duly transferred to him.

19. *Exchange membership.*—Members of the exchange must be organizations, companies, and detachments. By "detachments" is meant an organization consisting of a number of enlisted men not belonging or attached to a company, such as the Hospital Corps, Signal Corps, or band. Individual enlisted men, such as post or regimental noncommissioned officers or individual members of the Hospital or Signal Corps, can not become members of the exchange unless three or more of them are associated in a mess. When an exchange is first established the exchange council will fix the amount of assessment or contribution that shall entitle an organization to membership, which will be a proportionate part of the expense attending the fitting up and stocking the establishment. Whenever a company or detachment applies for membership in an exchange already organized, a careful estimate of the market value of the property will be made by a disinterested officer—preferably a field officer—who, whenever practicable, will be assisted in the performance of the duty by a representative of each party in interest; these appraisers will be designated by the post commander. The estimate must be approved by the commanding officer or submitted on appeal to the department commander, whose decision will be final. The amount to be paid by the incoming organizations may usually be determined by dividing the amount of appraisal by the total number of men composing the organizations that are already members of the exchange, which will give the per capita, and this multiplied by the number of men of an incoming organization will give its entrance fee. The sum thus paid into the funds of the exchange should be regarded the same as funds resulting from any other sale, and go to increase its cash account or working capital. It should not be divided among the members excepting as it may become divisible at a subsequent declaration of dividends. A company joining the exchange, when unable to pay its assessment in cash, may be charged with it, and such charge may be liquidated from the company's share of the profits of the exchange. An organization joining should pass to the exchange some written evidence of its debt and obligation to pay the amount assessed, and such paper should be carried on the books of the exchange as a "bill receivable" and be regarded as an asset, which should be reduced in value from time to time as the profits are divided. When an organization, by reason of change of station or for other cause, desires to withdraw from an exchange, the value of its shares being determined, that sum will be withdrawn from the gross funds of the exchange and paid over to the withdrawing organization. Any amount due, but, for lack of available funds, not paid to a company when retiring from the exchange, should be paid out of the first profits accruing to the institution; the amount so due and unpaid should be carried on the books of the exchange as a "bill payable," and be regarded as a liability until liquidated.

20. *Final disposition of business.*—When notice is received that the entire garrison of a post is to be withdrawn and the post discontinued, the exchange stock will be reduced to the lowest extent possible, and so far as may be, converted into cash. Prior to the departure of the troops the property of the exchange will be sold and the proceeds, together with the cash, equitably distributed, under the direction of the council, among the organizations that are members. The officer in charge will make a final report of the matter through military channels to the Adjutant-General of the Army.

By command of Lieutenant-General Miles:

H. C CORBIN,
Adjutant-General.

GENERAL ORDERS, }

No. 7.

HEADQUARTERS OF THE ARMY,
ADJUTANT-GENERAL'S OFFICE,
Washington, February 4, 1901.

By direction of the Secretary of War, the following changes in the stations of troops are ordered:

Tenth U. S. Infantry: The colonel, lieutenant-colonel, staff, noncommissioned staff, band, First and Second Battalions, from the Department of Cuba to the United States.

The Second Battalion will constitute the depot battalion of the regiment.

Upon disembarking in the United States the troops will proceed to stations as follows: The colonel, staff, noncommissioned staff, band, and Company E to Fort

Crook; Company H to Fort Niobrara; Company F to Fort Robinson, Department of the Missouri, and Company G to Fort Mackenzie, Department of the Colorado, to relieve the companies of the Third Battalion now at those posts; the lieutenant-colonel and the First Battalion to the Presidio of San Francisco, Department of California.

The Third Battalion will also proceed to the Presidio of San Francisco upon being relieved from its present stations.

The active battalions will be prepared for immediate service in the Division of the Philippines, and by transfers and recruitment filled to the maximum of 150 men per company.

Privates serving in the first year of their first enlistment and fit for tropical service will be transferred to companies of the active battalions. Enlisted men having less than six months to serve and who have not signified their intention to reenlist will be transferred to the depot battalion. The exchanges and transfers directed in General Orders, No. 153, 1899, Adjutant-General's Office, will also be made.

Noncommissioned officers shall not be reduced in consequence of transfer, but shall be carried as detached from their organizations until the transfers are completed by assignments to vacancies in their new commands.

The department commanders concerned will by concert of action arrange details of the movement, send to their proper commands the officers and men who have been transferred, provide troops for posts which would be left without sufficient garrisons, and report by telegraph to the Adjutant-General of the Army the dates of departure and arrival and strength of organizations.

The major and staff of the depot battalion will accompany the command going to Fort Crook and report upon arrival to the department commander for assignment to station.

Company commanders will make every proper effort to induce enlisted men going to the Philippine Islands who have relatives dependent upon them to make allotments of pay, as provided by General Orders, No. 149, August 17, 1899, from this office, reporting their names to the Adjutant-General of the Army.

Property left behind by the troops will be securely packed, marked, and listed in duplicate.

The Quartermaster's Department will furnish the necessary transportation, the Subsistence Department suitable travel rations, and the Medical Department proper medical attendance and supplies.

By command of Lieutenant-General Miles.

H. C. CORBIN,
Adjutant-General.

GENERAL ORDERS, }
No. 8.

HEADQUARTERS OF THE ARMY,
ADJUTANT-GENERAL'S OFFICE,
Washington, February 5, 1901.

By direction of the Secretary of War, General Orders, No. 147, September 17, 1898, from this office, and paragraph I, circular No. 44, October 26, 1898, from this office, are rescinded, and the following is published for the information and guidance of all concerned:

1. Enlisted men of volunteer organizations who after muster out or discharge therefrom enlist in the Regular Army will be credited with their service in the volunteers and their enlistment papers will be indorsed as directed in paragraph 836 of the Regulations. The enlistment in the Regular Army will be for three years from date of such enlistment, without condition regarding discharge, and will be preceded by the usual medical examination required at recruiting stations. Examination forms and figure cards will be prepared and disposed of in accordance with the instructions governing other enlistments in the Regular Army.

2. Soldiers serving in volunteer organizations in the Division of the Philippines which are under orders to proceed to the United States, whose service has been honest and faithful and who desire to enlist at once in the Regular Army for some organization in the Philippine Islands, may be subjected to the usual examination at a recruiting station or military post, and if they meet all requirements their department commanders may order their discharge by reason of their services being no longer required.

3. Volunteer soldiers in the United States whose service has been honest and faithful and who desire to enlist in the Regular Army, and are found upon examination at a post or recruiting station to fully meet all requirements, may be discharged upon application to this office, which the proper commanding officer or the recruiting officer may telegraph, clearly stating the facts.

4. Volunteer soldiers discharged under the provisions of this order will be entitled to travel allowances for the *land* travel involved from place of discharge to place of enlistment in the Volunteers, their discharges being given for the interests of the public service. They may be reenlisted in the Regular Army as herein provided without special authority from this office, the provisions of paragraph 838, clause 1, of the Regulations being waived in their cases. Their discharge certificates and final statements will show as cause for discharge, "services no longer required."

5. The cases of former enlisted men of Volunteers who are over 35 years of age and seek to enter the Regular Army *more* than three months after discharge will be governed by paragraph 838, clause 3, of the Regulations; but when discharged Volunteer soldiers reenlist in the Regular Army *within three months after discharge*, the age limitation does not apply and the applicants need not sign the declaration of recruit on the enlistment form.

6. The indorsement required, pursuant to paragraph 836 of the Regulations, on the enlistment papers of men who have served in the Volunteers and subsequently enlist in the Regular Army, results in giving such soldiers credit on the records of the Department for time actually served in the Volunteers; but the term of enlistment or reenlistment in the Regular Army is not shortened by reason of their Volunteer service. They begin a new enlistment in the Regular Army for the full term of three years, and their clothing allowance likewise begins at the first year's rates. The principal advantages, however, accrue to those who reenlist in the Regular Army *within three months from date of discharge from the Volunteers*. In their cases the time actually served in the Volunteers is added to the time served in the Regular Army in computing the soldier's service pay, from time to time. For example:

Suppose John Smith to have served four months in the Volunteers and within three months after discharge therefrom to have reenlisted in the Regular Army, serving as a private. He would complete two years' continuous service upon serving one year and eight months in the Regular Army (with *pay proper* at \$13 per month). He would then enter upon the third year of continuous service, during which he would be entitled to \$14 per month. With the expiration of two years and eight months of his new enlistment he would complete three years' continuous service and enter upon the fourth year, entitling him to \$15 per month. After serving four months in this fourth year his three years' term of enlistment would expire. Should he again reenlist within three months from date of discharge the first eight months of such enlistment would complete his fourth year of continuous service at \$15 per month. During the next year—the fifth year of continuous service—he would draw \$16 per month, and after its close would become entitled to another \$2 per month for five years' continuous service, *i. e.*, \$18 per month. Each subsequent period of five years' continuous service would entitle him to \$1 per month additional.

The pay proper for the noncommissioned grades is subject to like increase for continuous service.

To the rates of pay named above 20 per cent of the *pay proper* is to be added in the cases of enlisted men serving in Porto Rico, Cuba, the Philippine Islands, Hawaii, and in the Territory of Alaska. In the case of a private this would be \$2.60 per month.

By command of Lieutenant-General Miles:

H. C. CORBIN, *Adjutant-General*.

GENERAL ORDERS, }
No. 9. }

HEADQUARTERS OF THE ARMY,
ADJUTANT-GENERAL'S OFFICE,
Washington, February 6, 1901.

The following act of Congress is published for the information and government of all concerned:

AN ACT to increase the efficiency of the permanent military establishment of the United States.

Be it enacted by the Senate and House of Representatives of the United States of America in Congress assembled, That from and after the approval of this act the Army of the United States, including the existing organizations, shall consist of fifteen regiments of cavalry, a corps of artillery, thirty regiments of infantry, one Lieutenant-General, six major-generals, fifteen brigadier-generals, an Adjutant-General's Department, an Inspector-General's Department, a Judge-Advocate-General's Department, a Quartermaster's Department, a Subsistence Department, a Medical Department, a Pay Department, a Corps of Engineers, an Ordnance Department, a Signal Corps, the officers of the Record and Pension Office, the chaplains, the officers and enlisted men

of the Army on the retired list, the professors, corps of cadets, the army detachments and band at the United States Military Academy, Indian scouts as now authorized by law, and such other officers and enlisted men as may hereinafter be provided for: *Provided*, That when a vacancy shall occur through death, retirement, or other separation from active service in the office of storekeeper, now provided for by law in the Quartermaster's Department and Ordnance Department, respectively, said office shall cease to exist.

SEC. 2. That each regiment of cavalry shall consist of one colonel, one lieutenant-colonel, three majors, fifteen captains, fifteen first lieutenants, and fifteen second lieutenants; two veterinarians, one sergeant-major, one quartermaster-sergeant, one commissary-sergeant, three squadron sergeants-major, two color sergeants with rank, pay, and allowances of squadron sergeant-major, one band, and twelve troops organized into three squadrons of four troops each. Of the officers herein provided, the captains and lieutenants not required for duty with the troops shall be available for detail as regimental and squadron staff officers and such other details as may be authorized by law or regulations. Squadron adjutants shall receive one thousand eight hundred dollars per annum and the allowances of first lieutenant; squadron quartermasters and commissaries shall receive one thousand six hundred dollars per annum and the allowances of second lieutenants. Each cavalry band shall be organized as now provided by law. Each troop of cavalry shall consist of one captain, one first lieutenant, one second lieutenant, one first sergeant, one quartermaster-sergeant, six sergeants, six corporals, two cooks, two farriers and blacksmiths, one saddler, one wagoner, two trumpeters, and forty-three privates; the commissioned officers to be assigned from among those hereinbefore authorized: *Provided*, That the President, in his discretion, may increase the number of corporals in any troop of cavalry to eight, and the number of privates to seventy-six, but the total number of enlisted men authorized for the whole Army shall not at any time be exceeded.

SEC. 3. That the regimental organization of the artillery arm of the United States Army is hereby discontinued, and that arm is constituted and designated as the Artillery Corps. It shall be organized as hereinafter specified and shall belong to the line of the Army.

SEC. 4. That the Artillery Corps shall comprise two branches—the coast artillery and the field artillery. The coast artillery is defined as that portion charged with the care and use of the fixed and movable elements of land and coast fortifications, including the submarine mine and torpedo defenses, and the field artillery as that portion accompanying an army in the field, and including field and light artillery proper, horse artillery, siege artillery, mountain artillery, and also machine-gun batteries: *Provided*, That this shall not be construed to limit the authority of the Secretary of War to order coast artillery to any duty which the public service demands or to prevent the use of machine or other field guns by any other arm of the service under the direction of the Secretary of War.

SEC. 5. That all officers of artillery shall be placed on one list, in respect to promotion, according to seniority in their several grades, and shall be assigned to coast or to field artillery according to their special aptitude for the respective services.

SEC. 6. That the Artillery Corps shall consist of a chief of artillery, who shall be selected and detailed by the President from the colonels of artillery, to serve on the staff of the general officer commanding the Army, and whose duties shall be prescribed by the Secretary of War; fourteen colonels, one of whom shall be the chief of artillery; thirteen lieutenant-colonels, thirty-nine majors, one hundred and ninety-five captains, one hundred and ninety-five first lieutenants, one hundred and ninety-five second lieutenants; and the captains and lieutenants provided for in this section not required for duty with batteries or companies shall be available for duty as staff officers of the various artillery garrisons and such other details as may be authorized by law and regulations; twenty-one sergeants-major, with the rank, pay, and allowances of regimental sergeants-major of infantry; twenty-seven sergeants-major, with the rank, pay, and allowances of battalion sergeants-major of infantry; one electrician sergeant to each coast artillery post having electrical appliances; thirty batteries of field artillery, one hundred and twenty-six batteries of coast artillery, and ten bands organized as now authorized by law for artillery regiments: *Provided*, That the aggregate number of enlisted men for the artillery, as provided under this act, shall not exceed eighteen thousand nine hundred and twenty, exclusive of electrician sergeants.

SEC. 7. That each company of coast artillery shall be organized as is now prescribed by law for a battery of artillery: *Provided*, That the enlisted strength of any company may be fixed, under the direction of the Secretary of War, according to the requirements of the service to which it may be assigned: *And provided*, That first-class gunners shall receive two dollars a month, and second-class gunners one dollar per month in addition to their pay.

SEC. 8. That each battery of field artillery shall be organized as is now prescribed by law, and the enlisted strength thereof shall be fixed under the direction of the Secretary of War.

SEC. 9. That the increase herein provided for the artillery shall be made as follows: Not less than twenty per centum before July first, nineteen hundred and one, and not less than twenty per centum each succeeding twelve months until the total number provided for shall have been attained. All vacancies created or caused by this act shall be filled by promotion according to seniority in the artillery arm. Second lieutenants of infantry or cavalry may, in the discretion of the President, be transferred to the artillery arm, taking rank therein according to date of commission, and such transfers shall be subject to approval by a board of artillery officers appointed to pass upon the capacity of such officers for artillery service: *Provided*, That the increase of officers of artillery shall be only in proportion to the increase of men.

SEC. 10. That each regiment of infantry shall consist of one colonel, one lieutenant-colonel, three majors, fifteen captains, fifteen first lieutenants, and fifteen second lieutenants; one sergeant-major, one quartermaster-sergeant, one commissary-sergeant, three battalion sergeants-major, two color sergeants, with rank, pay, and allowances of battalion sergeants-major, one band, and twelve companies, organized into three battalions of four companies each. Of the officers herein provided, the captains and lieutenants not required for duty with the companies shall be available for detail as regimental and battalion staff officers and such other details as may be authorized by law or regulations. Battalion adjutants shall receive one thousand eight hundred dollars per annum and the allowances of first lieutenants, mounted; battalion quartermasters and commissaries shall receive one thousand six hundred dollars per annum and the allowances of second lieutenants, mounted. Each infantry band shall be organized as now provided by law. Each infantry company shall consist of one captain, one first lieutenant, one second lieutenant, one first sergeant, one quartermaster-sergeant, four sergeants, six corporals, two cooks, two musicians, one artificer, and forty-eight privates, the commissioned officers to be assigned from those hereinbefore authorized: *Provided*, That the President, in his discretion, may increase the number of sergeants in any company of infantry to six, the number of corporals to ten, and the number of privates to one hundred and twenty-seven, but the total number of enlisted men authorized for the whole Army shall not, at any time, be exceeded.

SEC. 11. That the enlisted force of the Corps of Engineers shall consist of one band and three battalions of engineers. The engineers band shall be organized as now provided by law for bands of infantry regiments. Each battalion of engineers shall consist of one sergeant-major, one quartermaster-sergeant, and four companies. Each company of engineers shall consist of one first sergeant, one quartermaster-sergeant, with the rank, pay, and allowances of sergeant, eight sergeants, ten corporals, two musicians, two cooks, thirty-eight first-class and thirty-eight second-class privates: *Provided*, That the President may, in his discretion, increase the number of sergeants in any company of engineers to twelve, the number of corporals to eighteen, the number of first-class privates to sixty-four, and the number of second-class privates to sixty-four, but the total number of enlisted men authorized for the whole Army shall not, at any time, be exceeded: *And provided*, That officers detailed from the Corps of Engineers to serve as battalion adjutants and battalion quartermasters and commissaries shall, while so serving, receive the pay and allowances herein authorized for battalion staff officers of infantry regiments.

SEC. 12. That the President is authorized to appoint, by and with the advice and consent of the Senate, chaplains in the Army, at the rate of one for each regiment of cavalry and infantry in the United States service and twelve for the corps of artillery, with the rank, pay, and allowances of captains of infantry: *Provided*, That no person shall be appointed a chaplain in the Regular Army who shall have passed the age of forty years, nor until he shall have established his fitness as required by existing law: *And provided*, That the office of post chaplain is abolished, and the officers now holding commissions as chaplains, or who may hereafter be appointed chaplains shall be assigned to regiments or to the corps of artillery. Chaplains may be assigned to such stations as the Secretary of War shall direct, and they may be transferred, as chaplains, from one branch of the service or from one regiment to another by the Secretary of War, without further commission. When serving in the field, chaplains shall be furnished with necessary means of transportation by the Quartermaster's Department.

SEC. 13. That the Adjutant-General's Department shall consist of one Adjutant-General with the rank of major-general, and when a vacancy shall occur in the office of Adjutant-General on the expiration of the service of the present incumbent, by retirement or otherwise, the Adjutant-General shall thereafter have the rank and pay

of a brigadier-general, five assistant adjutants-general with the rank of colonel, seven assistant adjutants-general with the rank of lieutenant-colonel, and fifteen assistant adjutants-general with the rank of major: *Provided*, That all vacancies created or caused by this section shall, as far as possible, be filled by promotion according to seniority of officers of the Adjutant-General's Department.

SEC. 14. That the Inspector-General's Department shall consist of one Inspector-General with the rank of brigadier-general, four inspectors-general with the rank of colonel, four inspectors-general with the rank of lieutenant-colonel, and eight inspectors-general with the rank of major: *Provided*, That all vacancies created or caused by this section shall be filled, as far as possible, by promotion according to seniority of officers of the Inspector-General's Department.

SEC. 15. That the Judge-Advocate-General's Department shall consist of one Judge-Advocate-General with the rank of brigadier-general, two judge-advocates with the rank of colonel, three judge-advocates with the rank of lieutenant-colonel, six judge-advocates with the rank of major, and for each geographical department or tactical division of troops not provided with a judge-advocate from the list of officers holding permanent commissions in the Judge-Advocate-General's Department one acting judge-advocate with the rank, pay, and allowances of captain, mounted. Promotions to vacancies above the grade of major, created or caused by this Act, shall be made, according to seniority, from officers now holding commission in the Judge-Advocate-General's Department. Vacancies created or caused by this act in the grade of major may be filled by appointment of officers holding commissions as judge-advocate of Volunteers since April twenty-first, eighteen hundred and ninety-eight. Vacancies which may occur thereafter in the grade of major in the Judge-Advocate-General's Department shall be filled by the appointment of officers of the line, or of persons who have satisfactorily served as judge-advocates of Volunteers since April twenty-first, eighteen hundred and ninety-eight, or of persons from civil life who at date of appointment are not over thirty-five years of age and who shall pass a satisfactory examination to be prescribed by the Secretary of War.

Acting judge-advocates provided for herein shall be detailed from officers of the grades of captain or first lieutenant of the line of the Army who while so serving shall continue to hold their commissions in the arm of the service to which they permanently belong. Upon completion of a tour of duty not exceeding four years they shall be returned to the arm in which commissioned, and shall not be again detailed until they shall have completed two years' duty within the arm of the service in which commissioned.

SEC. 16. That the Quartermaster's Department shall consist of one Quartermaster-General with the rank of brigadier-general, six assistant quartermasters-general with the rank of colonel, nine deputy quartermasters-general with the rank of lieutenant-colonel, twenty quartermasters with the rank of major, sixty quartermasters with the rank of captain, mounted; the military storekeeper now provided for by law, and one hundred and fifty post quartermaster-sergeants: *Provided*, That all vacancies in the grade of colonel, lieutenant-colonel, and major created or caused by this section shall be filled by promotion according to seniority, as now prescribed by law. That to fill original vacancies in the grade of captain created by this act in the Quartermaster's Department the President is authorized to appoint officers of volunteers commissioned in the Quartermaster's Department since April twenty-first, eighteen hundred and ninety-eight: *Provided further*, That the President is authorized to continue in service, during the present emergency, for duty in the Philippine Islands and on transports, twenty-four captains and assistant quartermasters of volunteers. This authority shall extend only for the period when their services shall be absolutely necessary.

SEC. 17. That the Subsistence Department shall consist of one Commissary-General with the rank of brigadier-general, three assistant commissaries-general with the rank of colonel, four deputy commissaries-general with the rank of lieutenant-colonel, nine commissaries with the rank of major, twenty-seven commissaries with the rank of captain, mounted, and the number of commissary-sergeants now authorized by law, who shall hereafter be known as post commissary-sergeants: *Provided*, That all vacancies in the grades of colonel, lieutenant-colonel, and major created or caused by this section, shall be filled by promotion according to seniority, as now prescribed by law. That to fill original vacancies in the grade of captain created by this act in the Subsistence Department, the President is authorized to appoint officers of volunteers commissioned in the Subsistence Department since April twenty-first, eighteen hundred and ninety-eight.

SEC. 18. That the Medical Department shall consist of one Surgeon-General with the rank of brigadier-general, eight assistant surgeons-general with the rank of colonel, twelve deputy surgeons-general with the rank of lieutenant-colonel, sixty sur-

geons with the rank of major, two hundred and forty assistant surgeons with the rank of captain or first lieutenant, the Hospital Corps, as now authorized by law, and the Nurse Corps: *Provided*, That all vacancies in the grades of colonel, lieutenant-colonel, and major created or caused by this section shall be filled by promotion according to seniority, subject to the examination now prescribed by law: *And provided*, That the period during which any assistant surgeon shall have served as a surgeon or assistant surgeon in the Volunteer Army during the war with Spain or since shall be counted as a portion of the five years' service required to entitle him to rank of captain: *And provided also*, That nothing in this section shall affect the relative rank for promotion of any assistant surgeon now in the service, or who may be hereafter appointed therein, as determined by the date of his appointment or commission and as fixed in accordance with existing law and regulations: *Provided further*, That in emergencies the Surgeon-General of the Army, with the approval of the Secretary of War, may appoint as many contract surgeons as may be necessary, at a compensation not to exceed one hundred and fifty dollars per month. That on or after the passage of this act the President may appoint for duty in the Philippine Islands, fifty surgeons of volunteers with the rank and pay of major, and one hundred and fifty assistant surgeons of volunteers with the rank and pay of captain, mounted, for a period of two years: *Provided*, That so many of these volunteer medical officers as are not required shall be honorably discharged the service whenever in the opinion of the Secretary of War their services are no longer necessary: *Provided further*, That assistant surgeons in the Volunteer Army of the United States commissioned by the President as captains, in accordance with the provisions of an act for increasing the efficiency of the Army of the United States, and for other purposes, approved March second, eighteen hundred and ninety-nine, shall be entitled to the pay of a captain, mounted, from the date of their acceptance of such commission, as prescribed by law: *Provided*, That the Surgeon-General of the Army, with the approval of the Secretary of War, be, and he is hereby, authorized to employ dental surgeons to serve the officers and enlisted men of the Regular and Volunteer Army, in the proportion of not to exceed one for every one thousand of said Army, and not exceeding thirty in all. Said dental surgeons shall be employed as contract dental surgeons under the terms and conditions applicable to army contract surgeons, and shall be graduates of standard medical or dental colleges, trained in the several branches of dentistry, of good moral and professional character, and shall pass a satisfactory professional examination: *Provided*, That three of the number of dental surgeons to be employed shall be first appointed by the Surgeon-General, with the approval of the Secretary of War, with reference to their fitness for assignment, under the direction of the Surgeon-General, to the special service of conducting the examinations and supervising the operations of the others; and for such special service an extra compensation of sixty dollars a month will be allowed: *Provided further*, That dental college graduates now employed in the Hospital Corps who have been detailed for a period of not less than twelve months to render dental service to the Army and who are shown by the reports of their superior officers to have rendered such service satisfactorily may be appointed contract dental surgeons without examination: *Provided*, That the Secretary of War be authorized to appoint in the Hospital Corps, in addition to the two hundred hospital stewards now allowed by law, one hundred hospital stewards: *Provided*, That men who have served as hospital stewards of volunteer regiments or acted in that capacity during and since the Spanish-American war for more than six months may be appointed hospital stewards in the Regular Army: *And provided further*, That all men so appointed shall be of good moral character and shall have passed a satisfactory mental and physical examination.

SEC. 19. That the nurse corps (female) shall consist of one superintendent, to be appointed by the Secretary of War, who shall be a graduate of a hospital training school having a course of instruction of not less than two years, whose term of office may be terminated at his discretion, whose compensation shall be one thousand eight hundred dollars per annum, and of as many chief nurses, nurses, and reserve nurses as may be needed. Reserve nurses may be assigned to active duty when the emergency of the service demands, but shall receive no compensation except when on such duty: *Provided*, That all nurses in the nurse corps shall be appointed or removed by the Surgeon-General, with the approval of the Secretary of War; that they shall be graduates of hospital training schools, and shall have passed a satisfactory, professional, moral, mental, and physical examination: *And provided*, That the superintendent and nurses shall receive transportation and necessary expenses when traveling under orders; that the pay and allowances of nurses, and of reserve nurses when on active service, shall be forty dollars per month when on duty in the United States and fifty dollars per month when without the limits of the United

States. They shall be entitled to quarters, subsistence, and medical attendance during illness, and they may be granted leaves of absence for thirty days, with pay, for each calendar year; and when serving as chief nurses their pay may be increased by authority of the Secretary of War, such increase not to exceed twenty-five dollars per month. Payments to the nurse corps shall be made by the Pay Department.

SEC. 20. That the grade of veterinarian of the second class in cavalry regiments, United States Army, is hereby abolished, and hereafter the two veterinarians authorized for each cavalry regiment and the one veterinarian authorized for each artillery regiment shall receive the pay and allowances of second lieutenants mounted. Such number of veterinarians as the Secretary of War may authorize shall be employed to attend animals pertaining to the quartermaster's or other departments not directly connected with the cavalry and artillery regiments, at a compensation not exceeding one hundred dollars per month.

SEC. 21. That the Pay Department shall consist of one Paymaster-General with the rank of brigadier-general, three assistant paymasters-general with the rank of colonel, four deputy paymasters-general with the rank of lieutenant-colonel, twenty paymasters with the rank of major, and twenty-five paymasters with the rank of captain, mounted: *Provided*, That all vacancies in the grade of colonel and lieutenant-colonel created or caused by this section shall be filled by promotion according to seniority, as now prescribed by law, and no more appointments to the grade of major and paymaster shall be made until the number of majors and paymasters is reduced below twenty: *And provided*, That persons who have served in the Volunteer Army since April twenty-first, eighteen hundred and ninety-eight, as additional paymasters may be appointed to positions in the grade of captain, created by this section. So long as there remain surplus majors an equal number of vacancies shall be held in the grade of captain, so that the total number of paymasters authorized by this section shall not be exceeded at any time.

SEC. 22. That the Corps of Engineers shall consist of one Chief of Engineers with the rank of brigadier-general, seven colonels, fourteen lieutenant-colonels, twenty-eight majors, forty captains, forty first lieutenants, and thirty second lieutenants. The enlisted force provided in section eleven of this act and the officers serving therewith shall constitute a part of the line of the Army: *Provided*, That the Chief of Engineers shall be selected as now provided by law, and hereafter vacancies in the Corps of Engineers in all other grades above that of second lieutenant shall be filled, as far as possible, by promotion according to seniority from the Corps of Engineers: *And provided also*, That vacancies remaining in the grades of first and second lieutenant may be filled by transfer of officers of the Regular Army, subject to such professional examination as may be approved by the Secretary of War. Vacancies in the grade of second lieutenant not filled by transfer shall be left for future promotions from the corps of cadets at the United States Military Academy.

SEC. 23. That the Ordnance Department shall consist of one Chief of Ordnance with the rank of brigadier-general, four colonels, six lieutenant-colonels, twelve majors, twenty-four captains, and twenty-four first lieutenants, the ordnance storekeeper, and the enlisted men, including ordnance sergeants, as now authorized by law. All vacancies created or caused by this section shall, as far as possible, be filled by promotion according to seniority, as now prescribed by law.

SEC. 24. That the Signal Corps shall consist of one Chief Signal Officer with the rank of brigadier-general, one colonel, one lieutenant-colonel, four majors, fourteen captains, fourteen first lieutenants, eighty first-class sergeants, one hundred and twenty sergeants, one hundred and fifty corporals, two hundred and fifty first-class privates, one hundred and fifty second-class privates, and ten cooks: *Provided*, That vacancies created or caused by this section shall be filled by promotion of officers of the Signal Corps according to seniority, as now provided by law. Vacancies remaining after such promotions may be filled by appointment of persons who have served in the Volunteer Signal Corps since April twenty-first, eighteen hundred and ninety-eight: *Provided*, That the President is authorized to continue in service during the present emergency, for duty in the Philippine Islands, five volunteer signal officers with the rank of first lieutenant and five volunteer signal officers with the rank of second lieutenant. This authority shall extend only for the period when their services may be absolutely necessary.

SEC. 25. That the officers of the Record and Pension Office of the War Department shall be a chief of said office with the rank of brigadier-general, and an assistant chief of said office with the rank of major: *Provided*, That any person appointed to be Chief of the Record and Pension Office after the passage of this act shall have the rank of colonel.

SEC. 26. That so long as there remain any officers holding permanent appointments in the Adjutant-General's Department, the Inspector-General's Department, the

Quartermaster's Department, the Subsistence Department, the Pay Department, the Ordnance Department, and the Signal Corps, including those appointed to original vacancies in the grades of captain and first lieutenant under the provisions of sections sixteen, seventeen, twenty-one, and twenty-four of this act, they shall be promoted according to seniority in the several grades, as now provided by law, and nothing herein contained shall be deemed to apply to vacancies which can be filled by such promotions or to the periods for which the officers so promoted shall hold their appointments, and when any vacancy, except that of the chief of the department or corps, shall occur, which can not be filled by promotion as provided in this section, it shall be filled by detail from the line of the Army, and no more permanent appointments shall be made in those departments or corps after the original vacancies created by this act shall have been filled. Such details shall be made from the grade in which the vacancies exist, under such system of examination as the President may from time to time prescribe.

All officers so detailed shall serve for a period of four years, at the expiration of which time they shall return to duty with the line, and officers below the rank of lieutenant-colonel shall not again be eligible for selection in any staff department until they shall have served two years with the line.

That when vacancies shall occur in the position of chief of any staff, corps, or department the President may appoint to such vacancies, by and with the advice and consent of the Senate, officers of the Army at large not below the rank of lieutenant-colonel, and who shall hold office for terms of four years. When a vacancy in the position of chief of any staff, corps, or department is filled by the appointment of an officer below the rank now provided by law for said office, said chief shall, while so serving, have the same rank, pay, and allowances now provided for the chief of such corps or department. And any officer now holding office in any corps or department who shall hereafter serve as chief of a staff, corps, or department and shall subsequently be retired, shall be retired with the rank, pay, and allowances authorized by law for the retirement of such corps or department chief: *Provided*, That so long as there remain in service officers of any staff, corps, or department holding permanent appointments, the chief of such staff, corps, or department shall be selected from the officers so remaining therein.

SEC. 27. That each position vacated by officers of the line, transferred to any department of the staff for tours of service under this act, shall be filled by promotion in the line until the total number detailed equals the number authorized for duty in each staff department. Thereafter vacancies caused by details from the line to the staff shall be filled by officers returning from tours of staff duty. If under the operation of this act the number of officers returned to any particular arm of the service at any time exceeds the number authorized by law in any grade, promotions to that grade shall cease until the number has been reduced to that authorized.

SEC. 28. That vacancies in the grade of field officers and captain, created by this act, in the cavalry, artillery, and infantry shall be filled by promotion according to seniority in each branch, respectively. Vacancies existing after the promotions have been made shall be provided for as follows: A sufficient number shall be reserved in the grade of second lieutenant for the next graduating class of the United States Military Academy.

Persons not over forty years of age who shall have at any time served as volunteers subsequent to April twenty-first, eighteen hundred and ninety-eight, may be ordered before boards of officers for such examination as may be prescribed by the Secretary of War, and those who establish their fitness before these examining boards may be appointed to the grades of first or second lieutenant in the Regular Army, taking rank in the respective grades according to seniority as determined by length of prior commissioned service; but no person appointed under the provisions of this section shall be placed above another in the same grade with longer commissioned service, and nothing herein contained shall change the relative rank of officers heretofore commissioned in the Regular Army.

Enlisted men of the Regular Army or Volunteers may be appointed second lieutenants in the Regular Army to vacancies created by this act, provided that they shall have served one year, under the same conditions now authorized by law for enlisted men of the Regular Army.

SEC. 29. That to fill vacancies occurring from time to time in the several organizations serving without the limits of the United States with trained men, the President is authorized to enlist recruits in numbers equal to four per centum in excess of the total strength authorized for such organizations.

SEC. 30. That the President is authorized to maintain the enlisted force of the several organizations of the Army at their maximum strength as fixed by this act during the present exigencies of the service, or until such time as Congress may here-

after otherwise direct: *Provided*, That in the event of the enlistment of a soldier in the Army for the period required by law, and after the expiration of one year of service, should either of his parents die, leaving the other solely dependent upon the soldier for support, such soldier may, upon his own application, be honorably discharged from the service of the United States upon due proof being made of such condition to the Secretary of War.

SEC. 31. That the Secretary of War is authorized to detach from the Army at large such number of enlisted men as may be necessary to perform duty at the various recruiting stations, and while performing such duty one member of each party shall have the rank, pay, and allowances of sergeant, and one the rank, pay, and allowances of corporal, of the arm of the service to which they respectively belong.

SEC. 32. That when the exigencies of the service of any officer who would be entitled to promotion upon examination require him to remain absent from any place where an examining board could be convened, the President is hereby authorized to promote such officer, subject to examination, and the examination shall take place as soon thereafter as practicable. If upon examination the officer be found disqualified for promotion he shall, upon the approval of the proceedings by the Secretary of War, be treated in the same manner as if he had been examined prior to promotion.

SEC. 33. The President of the United States is hereby authorized to select from the brigadier-generals of volunteers two volunteer officers, without regard to age, and, by and with the advice and consent of the Senate, appoint them brigadier-generals, United States Army, for the purpose of placing them on the retired list.

And the President is hereby also authorized to select from the retired list of the Army an officer not above the rank of brigadier-general who may have distinguished himself during the war with Spain, in command of a separate army, and to appoint, by and with the advice and consent of the Senate, the officer so selected to be major-general, United States Army, with the pay and allowances established by law for officers of that grade on the retired list.

SEC. 34. That all officers who have served during the war with Spain, or since, as officers of the Regular or Volunteer Army of the United States, and have been honorably discharged from the service by resignation or otherwise, shall be entitled to bear the official title, and upon occasions of ceremony, to wear the uniform of the highest grade they have held by brevet or other commission in the regular or volunteer service.

SEC. 35. That the Secretary of War be, and he is hereby, authorized and directed to cause preliminary examinations and surveys to be made for the purpose of selecting four sites with a view to the establishment of permanent camp grounds for instruction of troops of the Regular Army and National Guard, with estimates of the cost of the sites and their equipment with all modern appliances, and for this purpose is authorized to detail such officers of the Army as may be necessary to carry on the preliminary work; and the sum of ten thousand dollars is hereby appropriated for the necessary expense of such work, to be disbursed under the direction of the Secretary of War: *Provided*, That the Secretary of War shall report to Congress the result of such examination and surveys, and no contract for said sites shall be made nor any obligation incurred until Congress shall approve such selections and appropriate the money therefor.

SEC. 36. That when, in his opinion, the conditions in the Philippine Islands justify such action, the President is authorized to enlist natives of those islands for service in the Army, to be organized as scouts, with such officers as he shall deem necessary for their proper control, or as troops or companies, as authorized by this act, for the Regular Army. The President is further authorized, in his discretion, to form companies, organized as are companies of the Regular Army, in squadrons or battalions, with officers and noncommissioned officers corresponding to similar organizations in the cavalry and infantry arms. The total number of enlisted men in said native organizations shall not exceed twelve thousand, and the total enlisted force of the line of the Army, together with such native force, shall not exceed at any one time one hundred thousand.

The majors to command the squadrons and battalions shall be selected by the President from captains of the line of the Regular Army, and while so serving they shall have the rank, pay, and allowances of the grade of major. The captains of the troops or companies shall be selected by the President from first lieutenants of the line of the Regular Army, and while so serving they shall have the rank, pay, and allowances of captain of the arm to which assigned. The squadron and battalion staff officers, and first and second lieutenants of companies, may be selected from the noncommissioned officers or enlisted men of the Regular Army of not less than two years' service, or from officers or noncommissioned officers or enlisted men serving, or who have served, in the volunteers subsequent to April twenty-first, eighteen hundred and ninety-eight, and officers of those grades shall be given provisional appoint-

ments for periods of four years each, and no such appointment shall be continued for a second or subsequent term unless the officer's conduct shall have been satisfactory in every respect. The pay and allowances of provisional officers of native organizations shall be those authorized for officers of like grades in the Regular Army. The pay, rations, and clothing allowances to be authorized for the enlisted men shall be fixed by the Secretary of War, and shall not exceed those authorized for the Regular Army.

When, in the opinion of the President, natives of the Philippine Islands shall, by their services and character, show fitness for command, the President is authorized to make provisional appointments to the grades of second and first lieutenants from such natives, who, when so appointed, shall have the pay and allowances to be fixed by the Secretary of War, not exceeding those of corresponding grades of the Regular Army.

SEC. 37. That the President is authorized to organize and maintain one provisional regiment of not exceeding three battalions of infantry for service in Porto Rico, the enlisted strength thereof to be composed of natives of that island as far as practicable. The regiment shall be organized as to numbers as authorized for infantry regiments of the Regular Army. The pay, rations, and clothing allowances to be authorized for the enlisted men shall be fixed by the Secretary of War, and shall not exceed those authorized for the Regular Army. The field officers shall be selected from officers of the next lower grades in the Regular Army and shall, while so serving in the higher grade, have the rank, pay, and allowances thereof. The company and regimental and battalion staff officers shall be appointed by the President. The President may, in his discretion, continue with their own consent the volunteer officers and enlisted men of the Porto Rico regiment, whose term of service expire by law July first, nineteen hundred and one. Enlistments for the Porto Rico regiment shall be made for periods of three years, unless sooner discharged. The regiment shall be continued in service until further directed by Congress.

SEC. 38. The sale of or dealing in, beer, wine, or any intoxicating liquors by any person in any post exchange or canteen or army transport or upon any premises used for military purposes by the United States, is hereby prohibited. The Secretary of War is hereby directed to carry the provisions of this section into full force and effect.

SEC. 39. That nothing in this act shall be held or construed so as to discharge any officer from the Regular Army or to deprive him of the commission which he now holds therein.

SEC. 40. That the President be, and he is hereby, authorized to prescribe the kinds and quantities of the component articles of the army ration, and to direct the issue of substitutive equivalent articles in place of any such components whenever, in his opinion, economy and a due regard to the health and comfort of the troops may so require.

SEC. 41. That the distinctive badges adopted by military societies of men "who served in the armies and navies of the United States during the Spanish-American war and the incident insurrection in the Philippines" may be worn upon all occasions of ceremony by officers and men of the Army and Navy of the United States who are members of said organizations in their own right.

SEC. 42. That all laws and parts of laws inconsistent with the provisions of this act be, and the same are, hereby repealed.

Approved February 2, 1901.

By command of Lieutenant-General Miles:

H. C. CORBIN,
Adjutant-General.

GENERAL ORDERS, }
No. 12.

HEADQUARTERS OF THE ARMY,
ADJUTANT-GENERAL'S OFFICE,
Washington, February 8, 1901.

By direction of the Secretary of War the following is published to the Army for the information and guidance of all concerned:

1. The transport quartermaster on each United States Army transport engaged in Atlantic or Pacific traffic shall at the beginning of each voyage, or as soon thereafter as practicable, forward through the general superintendent of the home port to the Quartermaster-General of the Army a complete passenger list of all officers of the Army and their servants, and of all persons not belonging to any military organization aboard who were transported as passengers on such voyage, giving a copy of the authority under which he furnished transportation to each, or making proper

references to such authority if previously furnished. He shall at the same time forward to the Commissary-General of Subsistence, through the subsistence superintendent of the home port, a copy of such passenger list, unaccompanied by copies of authority but giving notations of the same. The names of officers of the Army and their servants and of passengers not entitled to free subsistence aboard will be grouped together in one class on these lists, and the names of those entitled to subsistence free will be grouped in another. Transport quartermasters on United States Army transports engaged in interisland traffic will forward similar passenger lists through the chief quartermaster and chief commissary of the department in which employed.

2. The transport commissary will file with his monthly account current, as a voucher thereto, a list giving the name of each officer of the Army and his servant, if any, and the name of each person not belonging to any military organization aboard, who were transported during the month and who were chargeable for meals, together with the amounts collected by him from each on account of meals furnished. Meals will be charged from the first meal served after embarkation of the passenger until the last meal served before debarkation. In reckoning for parts of a day each meal will be considered as one-third of a day's subsistence. Deductions will not be allowed for meals not taken during a voyage. The list will be made out on form No. 74, Subsistence Department.

By command of Lieutenant-General Miles:

H. C. CORBIN,
Adjutant-General.

GENERAL ORDERS, }
No. 13. }

HEADQUARTERS OF THE ARMY,
ADJUTANT-GENERAL'S OFFICE,
Washington, February 8, 1901.

I. By direction of the Secretary of War, the following changes in stations of troops are ordered:

Fifth U. S. Cavalry: The colonel, staff, noncommissioned staff, band, first and third squadrons, from the Departments of the East and Colorado, not later than March 9, 1901, to the Presidio of San Francisco, Department of California, preparatory to immediate service in the Division of the Philippines; these squadrons will by transfers and recruitment be filled to the maximum of 100 men per troop.

The second squadron, which will constitute the depot squadron of the regiment, will be relieved from its present stations, Fort Ethan Allen, Vt., and Jefferson Barracks, Mo., and proceed not later than March 1, 1901, to the Department of the Colorado and take station, relieving the first squadron, as follows: The major, staff, and Troops E and G to Fort Grant, Ariz.; Troop F to Fort Huachuca, Ariz.; Troop H to Fort Wingate, N. Mex.

Privates serving in the first year of their first enlistment and fit for tropical service will be transferred to troops of the active squadrons. Enlisted men having less than six months to serve, and who have not signified their intention to reenlist, will be transferred to the depot squadron. The exchanges and transfers directed in General Orders, No. 153, 1899, Adjutant-General's Office, will also be made. The foregoing transfers will be made under the direction of the regimental commander.

Noncommissioned officers shall not be reduced in consequence of transfer, but shall be carried as detached from their organizations until the transfers are completed by assignments to vacancies in their new commands.

The department commanders concerned will by concert of action arrange the details of the movement, send to their proper commands the officers and men who have been transferred, provide troops for posts which would be left without sufficient garrisons, and report by telegraph to the Adjutant-General of the Army the dates of departures and arrivals and strength of organizations.

Company commanders will make every proper effort to induce enlisted men going to the Philippine Islands who have relatives dependent upon them to make allotments of pay, as provided by General Orders, No. 149, August 17, 1899, from this office, reporting their names to the Adjutant-General of the Army.

Property left behind by the troops will be securely packed, marked, and listed in duplicate.

The Quartermaster's Department will furnish the necessary transportation, the Subsistence Department suitable subsistence, and the Medical Department proper medical attendance and supplies.

II. By direction of the Secretary of War, the first and second provisional battalions of infantry, now organized at the Presidio of San Francisco, are assigned as the first battalions of the Twenty-sixth and Twenty-seventh Regiments, U. S. Infantry,

respectively, and will proceed to the Division of the Philippines on the transport *Sheridan*, sailing from San Francisco on the 16th instant.

The commanding general, Department of California, will arrange the details of the movement and complete the battalion organizations.

The Quartermaster's Department will furnish the necessary transportation, the Subsistence Department suitable subsistence, and the Medical Department proper medical attendance and supplies.

By command of Lieutenant-General Miles:

H. C. CORBIN,
Adjutant-General.

GENERAL ORDERS, }

No. 14.

HEADQUARTERS OF THE ARMY,
ADJUTANT-GENERAL'S OFFICE,
Washington, February 12, 1901.

By direction of the Secretary of War, the additional regiments of cavalry and infantry authorized by act of Congress approved February 2, 1901, are hereby designated and assigned to stations, where they will be assembled, equipped, and organized as follows:

Cavalry—5 regiments.

Eleventh Cavalry: Headquarters at Fort Myer, Va.

Twelfth Cavalry: Headquarters at Fort Sam Houston, Tex.

Thirteenth Cavalry: Headquarters at Fort Meade, S. Dak.

Fourteenth Cavalry: Headquarters at Fort Leavenworth, Kans.

Fifteenth Cavalry: Headquarters at the Presidio of San Francisco, Cal.

Infantry—5 regiments.

Twenty-sixth Infantry: Headquarters at Fort McPherson, Ga. The first battalion of this regiment has been organized and assigned.

Twenty-seventh Infantry: Headquarters at Plattsburg Barracks, N. Y. The first battalion of this regiment has been organized and assigned.

Twenty-eighth Infantry: Headquarters at Vancouver Barracks, Wash.

Twenty-ninth Infantry: Headquarters at Fort Sheridan, Ill.

Thirtieth Infantry: Headquarters at Fort Logan, Colo.

Squadrons and battalions will be successively organized and equipped at regimental headquarters. Whenever the accommodations at any regimental headquarters are fully occupied and space is required for succeeding organizations, department commanders will recommend the transfer to other stations of units which are already organized and equipped; such stations to be selected with special reference to facilities for target practice.

The troops will be fully equipped and supplied for field service, and the supply departments will furnish the necessary arms, ammunition, equipment, and supplies.

By command of Lieutenant-General Miles.

H. C. CORBIN,
Adjutant-General.

GENERAL ORDERS, }

No. 15.

HEADQUARTERS OF THE ARMY,
ADJUTANT-GENERAL'S OFFICE,
Washington, February 13, 1901.

The following orders of the Secretary of War are published to the Army for the information and guidance of all concerned:

An act of Congress approved February 2, 1901, discontinues the regimental organization of the artillery arm and constitutes an Artillery Corps, consisting of coast artillery and field artillery, comprising 30 batteries of field artillery and 126 companies of coast artillery and enlisted men as follows:

Twenty-one sergeants-major with the rank, pay, and allowances of regimental sergeants-major of infantry;

Twenty-seven sergeants-major with the rank, pay, and allowances of battalion sergeants-major of infantry;

One electrician sergeant to each coast artillery post having electrical appliances, and

Ten bands, organized as heretofore authorized by law for artillery regiments.

The sergeants-major of the Artillery Corps who have the rank, pay, and allowances of regimental sergeants-major of infantry will be designated sergeants-major, senior

grade, and those having the rank, pay, and allowances of battalion sergeants-major of infantry will be designated as sergeants-major, junior grade, and will be borne on the rolls and records accordingly. The regimental sergeants-major will be transferred to the Artillery Corps and appointed sergeants-major therein in orders from this office. The present regimental quartermaster-sergeants of artillery will be in like manner transferred to and appointed sergeants-major, senior grade, in the Artillery Corps.

The officers of artillery not belonging to batteries will be reported on the returns of the commands in which they may be serving, and in addition will, until otherwise ordered, make monthly personal reports to the Adjutant-General of the Army stating the nature of their duties, etc. The noncommissioned staff officers of artillery will be also reported in figures and by name on the monthly returns of the commands in which they are serving.

Commanding officers of batteries and companies of artillery will hereafter render monthly returns direct to the Adjutant-General of the Army.

Monthly returns and bimonthly muster rolls of the artillery bands and muster rolls of the noncommissioned staff officers of the Artillery Corps will be made to the Adjutant-General by the commanding officers of the respective posts or stations at which they may be serving.

Commanding officers will prepare descriptive lists and accounts of pay and clothing of the noncommissioned staff officers, and will cause to be transcribed in new descriptive and clothing books the personal description, full record, and account of clothing drawn of each member of the artillery bands.

All records pertaining to the headquarters of the several artillery regiments, after the data required shall have been taken therefrom, will be carefully packed and marked and forwarded to the Adjutant-General of the Army.

Returns of artillery regiments, to include February 1, 1901, will be made by the officers commanding the same on that date and forwarded to the Adjutant-General without delay.

To conform to the new organization the designations of the batteries of artillery now in service are changed as follows:

Battery A, First Artillery, to be First Company, Coast Artillery.
 Battery B, First Artillery, to be Second Company, Coast Artillery.
 Battery C, First Artillery, to be Third Company, Coast Artillery.
 Battery D, First Artillery, to be Fourth Company, Coast Artillery.
 Light Battery E, First Artillery, to be First Battery, Field Artillery.
 Battery F, First Artillery, to be Fifth Company, Coast Artillery.
 Battery G, First Artillery, to be Sixth Company, Coast Artillery.
 Battery H, First Artillery, to be Seventh Company, Coast Artillery.
 Battery I, First Artillery, to be Eighth Company, Coast Artillery.
 Light Battery K, First Artillery, to be Second Battery, Field Artillery.
 Battery L, First Artillery, to be Ninth Company, Coast Artillery.
 Battery M, First Artillery, to be Tenth Company, Coast Artillery.
 Battery N, First Artillery, to be Eleventh Company, Coast Artillery.
 Battery O, First Artillery, to be Twelfth Company, Coast Artillery.
 Light Battery A, Second Artillery, to be Third Battery, Field Artillery.
 Battery B, Second Artillery, to be Thirteenth Company, Coast Artillery.
 Battery C, Second Artillery, to be Fourteenth Company, Coast Artillery.
 Battery D, Second Artillery, to be Fifteenth Company, Coast Artillery.
 Battery E, Second Artillery, to be Sixteenth Company, Coast Artillery.
 Light Battery F, Second Artillery, to be Fourth Battery, Field Artillery.
 Battery G, Second Artillery, to be Seventeenth Company, Coast Artillery.
 Battery H, Second Artillery, to be Eighteenth Company, Coast Artillery.
 Battery I, Second Artillery, to be Nineteenth Company, Coast Artillery.
 Battery K, Second Artillery, to be Twentieth Company, Coast Artillery.
 Battery L, Second Artillery, to be Twenty-first Company, Coast Artillery.
 Battery M, Second Artillery, to be Twenty-second Company, Coast Artillery.
 Battery N, Second Artillery, to be Twenty-third Company, Coast Artillery.
 Battery O, Second Artillery, to be Twenty-fourth Company, Coast Artillery.
 Battery A, Third Artillery, to be Twenty-fifth Company, Coast Artillery.
 Battery B, Third Artillery, to be Twenty-sixth Company, Coast Artillery.
 Light Battery C, Third Artillery, to be Fifth Battery, Field Artillery.
 Battery D, Third Artillery, to be Twenty-seventh Company, Coast Artillery.
 Battery E, Third Artillery, to be Twenty-eighth Company, Coast Artillery.
 Light Battery F, Third Artillery, to be Sixth Battery, Field Artillery.
 Battery G, Third Artillery, to be Twenty-ninth Company, Coast Artillery.
 Battery H, Third Artillery, to be Thirtieth Company, Coast Artillery.

Battery I, Third Artillery, to be Thirty-first Company, Coast Artillery.
 Battery K, Third Artillery, to be Thirty-second Company, Coast Artillery.
 Battery L, Third Artillery, to be Thirty-third Company, Coast Artillery.
 Battery M, Third Artillery, to be Thirty-fourth Company, Coast Artillery.
 Battery N, Third Artillery, to be Thirty-fifth Company, Coast Artillery.
 Battery O, Third Artillery, to be Thirty-sixth Company, Coast Artillery.
 Battery A, Fourth Artillery, to be Thirty-seventh Company, Coast Artillery.
 Light Battery B, Fourth Artillery, to be Seventh Battery, Field Artillery.
 Battery C, Fourth Artillery, to be Thirty-eighth Company, Coast Artillery.
 Battery D, Fourth Artillery, to be Thirty-ninth Company, Coast Artillery.
 Battery E, Fourth Artillery, to be Fortieth Company, Coast Artillery.
 Light Battery F, Fourth Artillery, to be Eighth Battery, Field Artillery.
 Battery G, Fourth Artillery, to be Forty-first Company, Coast Artillery.
 Battery H, Fourth Artillery, to be Forty-second Company, Coast Artillery.
 Battery I, Fourth Artillery, to be Forty-third Company, Coast Artillery.
 Battery K, Fourth Artillery, to be Forty-fourth Company, Coast Artillery.
 Battery L, Fourth Artillery, to be Forty-fifth Company, Coast Artillery.
 Battery M, Fourth Artillery, to be Forty-sixth Company, Coast Artillery.
 Battery N, Fourth Artillery, to be Forty-seventh Company, Coast Artillery.
 Battery O, Fourth Artillery, to be Forty-eighth Company, Coast Artillery.
 Battery A, Fifth Artillery, to be Forty-ninth Company, Coast Artillery.
 Battery B, Fifth Artillery, to be Fiftieth Company, Coast Artillery.
 Battery C, Fifth Artillery, to be Fifty-first Company, Coast Artillery.
 Light Battery D, Fifth Artillery, to be Ninth Battery, Field Artillery.
 Battery E, Fifth Artillery, to be Fifty-second Company, Coast Artillery.
 Light Battery F, Fifth Artillery, to be Tenth Battery, Field Artillery.
 Battery G, Fifth Artillery, to be Fifty-third Company, Coast Artillery.
 Battery H, Fifth Artillery, to be Fifty-fourth Company, Coast Artillery.
 Battery I, Fifth Artillery, to be Fifty-fifth Company, Coast Artillery.
 Siege Battery K, Fifth Artillery, to be Eleventh Battery, Field Artillery.
 Battery L, Fifth Artillery, to be Fifty-sixth Company, Coast Artillery.
 Battery M, Fifth Artillery, to be Fifty-seventh Company, Coast Artillery.
 Battery N, Fifth Artillery, to be Fifty-eighth Company, Coast Artillery.
 Battery O, Fifth Artillery, to be Fifty-ninth Company, Coast Artillery.
 Battery A, Sixth Artillery, to be Sixtieth Company, Coast Artillery.
 Battery B, Sixth Artillery, to be Sixty-first Company, Coast Artillery.
 Battery C, Sixth Artillery, to be Sixty-second Company, Coast Artillery.
 Light Battery D, Sixth Artillery, to be Twelfth Battery, Field Artillery.
 Battery E, Sixth Artillery, to be Sixty-third Company, Coast Artillery.
 Battery F, Sixth Artillery, to be Sixty-fourth Company, Coast Artillery.
 Light Battery G, Sixth Artillery, to be Thirteenth Battery, Field Artillery.
 Battery H, Sixth Artillery, to be Sixty-fifth Company, Coast Artillery.
 Battery I, Sixth Artillery, to be Sixty-sixth Company, Coast Artillery.
 Battery K, Sixth Artillery, to be Sixty-seventh Company, Coast Artillery.
 Battery L, Sixth Artillery, to be Sixty-eighth Company, Coast Artillery.
 Battery M, Sixth Artillery, to be Sixty-ninth Company, Coast Artillery.
 Battery N, Sixth Artillery, to be Seventieth Company, Coast Artillery.
 Battery O, Sixth Artillery, to be Seventy-first Company, Coast Artillery.
 Battery A, Seventh Artillery, to be Seventy-second Company, Coast Artillery.
 Battery B, Seventh Artillery, to be Seventy-third Company, Coast Artillery.
 Light Battery C, Seventh Artillery, to be Fourteenth Battery, Field Artillery.
 Battery D, Seventh Artillery, to be Seventy-fourth Company, Coast Artillery.
 Battery E, Seventh Artillery, to be Seventy-fifth Company, Coast Artillery.
 Battery F, Seventh Artillery, to be Seventy-sixth Company, Coast Artillery.
 Battery G, Seventh Artillery, to be Seventy-seventh Company, Coast Artillery.
 Battery H, Seventh Artillery, to be Seventy-eighth Company, Coast Artillery.
 Battery I, Seventh Artillery, to be Seventy-ninth Company, Coast Artillery.
 Battery K, Seventh Artillery, to be Eightieth Company, Coast Artillery.
 Battery L, Seventh Artillery, to be Eighty-first Company, Coast Artillery.
 Light Battery M, Seventh Artillery, to be Fifteenth Battery, Field Artillery.
 Battery N, Seventh Artillery, to be Eighty-second Company, Coast Artillery.
 Siege Battery O, Seventh Artillery, to be Sixteenth Battery, Field Artillery.
 The artillery bands now in service will be designated as follows:
 First Artillery Band to be First Band, Artillery Corps.
 Second Artillery Band to be Second Band, Artillery Corps.
 Third Artillery Band to be Third Band, Artillery Corps.
 Fourth Artillery Band to be Fourth Band, Artillery Corps.
 Fifth Artillery Band to be Fifth Band, Artillery Corps.

Sixth Artillery Band to be Sixth Band, Artillery Corps.
 Seventh Artillery Band to be Seventh Band, Artillery Corps.
 By command of Lieutenant General Miles:

H. C. CORBIN,
Adjutant-General.

GENERAL ORDERS, }
 No. 16.

HEADQUARTERS OF THE ARMY,
 ADJUTANT-GENERAL'S OFFICE,
 Washington, February 14, 1901.

The following act of Congress is published for the information and government of all concerned:

AN ACT for the payment of travel allowances on discharge from the Volunteer Army to certain officers and enlisted men who reentered the military service of the United States in the Philippine Islands.

Be it enacted by the Senate and House of Representatives of the United States of America in Congress assembled, That any officer of volunteers, and any enlisted man of either regulars or volunteers, who was discharged in the Philippine Islands and there reentered the service, through commission or enlistment, in the Thirty-sixth or Thirty-seventh regiments, United States Volunteer Infantry, or in the Eleventh Regiment, United States Volunteer Cavalry, shall, when discharged, except by way of punishment for an offense, receive for travel allowances, from the place of his discharge to the place in the United States of his last preceding appointment or enlistment, four cents per mile: *Provided*, That for sea travel, on discharge, from or between our island possessions actual expenses only shall be paid to officers, and transportation and subsistence only shall be furnished enlisted men: *Provided further*, That officers and enlisted men discharged in the United States under the provisions of this act shall not be entitled to transportation or travel allowance back to the Philippine Islands.

Approved February 8, 1901.

By command of Lieutenant-General Miles:

H. C. CORBIN,
Adjutant-General.

GENERAL ORDERS, }
 No. 17.

HEADQUARTERS OF THE ARMY,
 ADJUTANT-GENERAL'S OFFICE,
 Washington, February 15, 1901.

I. By direction of the Secretary of War and under the provisions of the act of Congress approved March 2, 1899 (published in General Orders, No. 36, from this office, March 4, 1899), "for increasing the efficiency of the Army of the United States and for other purposes," the volunteer force, officers and enlisted men, organized under said act will be mustered out of the United States service on or before June 30, 1901, as provided for in the following instructions published for the information and guidance of all concerned:

1. To facilitate the muster out of regiments in the United States the commanding officers of regiments will, prior to the departure of their commands from Manila, select an officer specially qualified for duty as assistant mustering officer, under whose supervision and that of the regimental commander company commanders will be required while en route to have the first copy of the muster-out roll accurately prepared, and officers who have been or are then responsible or accountable for public property, as company commanders or otherwise, will be required to make out the papers necessary for promptly rendering property returns accounting for losses, transfers, money charges against men, etc.

Upon arrival at the muster-out rendezvous, and when the date for the muster out of the regiment has been fixed, the four fair copies required will be made without delay.

2. Prior to the departure of a regiment from the Philippine Islands the assistant mustering officer will be required to make a careful inspection of the records of the regiment and cause them to be completed in every respect, and will by personal inspection see that correct descriptive lists and accounts of pay and clothing are furnished to the officers under whose immediate command they may be for all enlisted men absent sick and unable to join their commands before sailing, and that descriptive lists of such enlisted men as may be in captivity are furnished to the chief mustering officer of the division. The assistant mustering officer will also be required to make an alphabetical list by companies of all absentees and their addresses so far as

known, cause of absence and authority therefor, and deliver the same to the mustering officer charged with the muster out of the regiment, to whom he will report on arrival as assistant. In all matters pertaining to their duties as mustering officers, officers and men of organizations to be mustered out will be guided by the instructions of these officers, who are acting under the authority conferred by the Secretary of War.

3. The names of all officers and enlisted men who belonged to the organization prior and subsequent to the preparation of the organization roll *must be accounted for on the muster-out roll*, which is required to be a complete record of all the officers and enlisted men who ever belonged to the organization. Attention is especially invited in this respect to the printed instructions on the muster-out roll.

4. When the muster-out rolls have been prepared they will be carefully examined by a board of officers, to be appointed by the regimental commander, which will be furnished with the retained copy of the organization roll, with copies of all the muster rolls of the organization and other necessary data. Under the supervision of the mustering officer the board will compare rolls and other data with the muster-out rolls to insure their absolute correctness in all respects.

5. Discharge certificates will be prepared for every officer and enlisted man present, and for such officers and enlisted men *absent* from the command (sick, on leave, or on furlough) whose discharge from the service is not ordered herein to be executed by officers under whose immediate control such absentees may be at date of muster out.

Under the head of "Remarks" on the discharge certificate and the muster-out rolls record will be made as to whether or not the service of the soldier was *honest and faithful*. In this particular attention is invited to paragraph 148 of the Regulations as amended by General Orders, No. 10, of 1897, from this office.

6. Discharge certificates will be signed by the regimental commander for the non-commissioned staff and band and for *all* officers of the regiment, by company commanders for the enlisted men of their companies, and all will be countersigned by the mustering officer, who will deliver them to the paymaster for the purpose required in paragraph 1383 of the Regulations.

The chief mustering officer will sign the discharge certificates of regimental commanders.

7. The discharge from the United States Volunteer service in the cases of *all absentees* will take effect upon the muster out of the organizations to which they belong, except only in cases of officers and men held in captivity and such others as may be retained in the service under *special authority* granted by the Secretary of War.

8. When an organization is under orders to proceed to the United States for muster out, the commanding general, Division of the Philippines, will take the necessary steps to cause the return to it of *all* absentees except such as may be absolutely unable to join on account of illness or capture by the enemy, and such officers as may be necessary to be retained in the service under authority to be obtained from the Secretary of War. Officers and men unable to join on account of illness will be discharged by the chief mustering officer, Division of the Philippines, on the date of the muster out of their organizations in the United States, which date will be *cabled* to him by the mustering officer charged with the muster out of the regiment. Officers and enlisted men unable to join their commands on account of being in the hands of the enemy will, after coming under the control of the Government, be discharged on the date of the muster out of their organizations if practicable, or on the date of arrival from captivity at Manila, if the organizations to which they belong have been mustered out. The descriptive lists, with full statement of action taken in the above-mentioned cases, will be sent by the chief mustering officer to the Adjutant-General of the Army. All descriptive lists must contain a complete history of allotments of enlisted men, their duration, their discontinuance, either voluntary or imposed by court-martial forfeitures, their resumption, and any other facts necessary to arrive at a proper settlement on discharge or muster out.

9. In the cases of enlisted men absent at muster out, either in the Philippines or in the United States, discharge certificates and final statements will be carefully prepared from descriptive lists by officers under whose control they may be at the time, and the physical examination required will be made immediately prior to date of discharge, but when for sufficient reasons the physical examination can not be made prior to date of discharge it will be waived and notation thereof made on the descriptive lists, as neither officers nor men will be held in service for that purpose.

10. In the cases of officers absent at muster out, discharge certificates will be furnished them by the officers under whom they may be serving after the required physical examination has been made, if such examination is practicable, and they will

be notified to apply to the Paymaster-General of the Army for settlement of their accounts.

11. Officers and enlisted men absent on leave or furlough in the United States, and not under the immediate control of post or other commanders, will be notified by the mustering officer by letter of the date on which they will be discharged from the service on account of the muster out of their organizations, and the date of such notification will be placed on the muster-out rolls. The mustering officer will cause discharge certificates to be prepared for officers and discharge certificates and final statements for the enlisted men, and the final statements must show the place from which travel allowances are due. In the case of officers the necessary notation of the place from which travel allowances are due will be made on the discharge certificates under the head of "Remarks;" in both cases travel allowances will be paid only from the places where the discharge certificates were received by the persons concerned.

The discharge certificates and final statements will be sent to officers and men by registered mail, and the receipts therefor will be filed with the muster-out rolls, on which rolls will be entered the date when such papers were registered and mailed.

Soldiers on discharge will be advised to apply in person or by mail to the nearest paymaster (whose station will be given) for final payment, and the paymasters will be notified, as required by paragraph 150 of the Regulations. Officers will apply to the Paymaster-General of the Army for payment.

12. When volunteer organizations serving in the Philippine Islands receive orders to proceed to the United States for muster out of service, officers and enlisted men of such organizations whose service has been honest and faithful, who desire to remain in those islands, may be discharged by department commanders upon written application approved by company and regimental commanders.

13. Officers honorably discharged in the Philippines will be entitled to travel allowances for the *land travel* involved from place of their discharge to the place of actual residence at the time of appointment, and enlisted men to places of enlistment. For the *sea travel* officers are entitled to free transportation and actual expenses, and enlisted men to free transportation and subsistence of the kind furnished enlisted men in the service on any transport leaving the islands for the United States, on presenting their discharge certificates to the chief quartermaster of the division, who will furnish the same and cause the fact that transportation and subsistence have been furnished to be indorsed on said certificates.

The discharge certificates and the final statements in such cases must show clearly the place from which *land travel* allowances are due, if any, to port of embarkation and from port of debarkation in the United States to the place of residence or enlistment, as the case may be.

14. The physical examination of all officers and enlisted men prior to discharge in the Philippine Islands will be conducted as provided for in Paragraph II of this order, under the supervision of the chief mustering officer, who will also be charged with the examination of final statements before they are delivered to the men.

The physical examination of officers and men absent from their commands in the United States will be made in accordance with Paragraph II, and as directed in General Orders, No. 130, October 25, 1900, from this office.

15. Attention is invited to section 2, act of Congress approved January 12, 1899 (published in G. O. 13, 1899):

"Sec. 2. That officers who at any time were accountable or responsible for public property shall be required, before final payment is made to them on discharge from the service, to obtain certificates of nonindebtedness to the United States from only such of the bureaus of the War Department to which the property for which they were accountable or responsible pertains, and the certificate from the chief of the Division of Bookkeeping and Warrants, Treasury Department, and such certificates, accompanied by the affidavits of officers, of nonaccountability or nonresponsibility to other bureaus of the War Department, certified to by the commanding officer of the regiment or independent organization, shall warrant their final payment: *Provided*, That officers who have not been responsible at any time for public property shall be required to make affidavit of that fact, certified to by their commanding officers, which shall be accepted as sufficient evidence to warrant their final payment on their discharge from the service: *Provided further*, That mustering officers are empowered to administer oaths in all matters pertaining to the muster out of volunteers."

16. Officers having in their possession funds of the United States who are ordered discharged or mustered out of the service or relieved from duty will turn over their balances of public funds to an officer of the staff department to which the funds pertain, taking his receipt therefor, or deposit the funds in a United States depository to the credit of the Treasurer of the United States, close their accounts and transmit them

to the chief of the proper bureau of the War Department without unnecessary delay, accompanied by the proper vouchers and other papers relating thereto. This will greatly facilitate the final settlement of their accountability. Where funds are on deposit to their credit in a designated depository or in the Treasury of the United States, all unused checks will be turned over and accounted for as required by Army Regulations, 605 and 606, also 607 (as amended by General Orders, No. 181, Adjutant-General's Office, 1899), and Circular, No. 51, Adjutant-General's Office, October 19, 1899, and by regulations of the Treasury Department as per printed instructions in each book, retaining only the stubs of the checks issued by them.

Officers of the volunteers who at any time were accountable or responsible for public property will on discharge from the service be paid *only* the travel allowances due them, and no other payments will be made to them until they shall have satisfactorily accounted for the public property for which they were accountable or responsible. They will not be retained in the service beyond the date of muster out of their organizations for the purpose of completing their accounts and returns.

17. Mustering officers are hereby designated to act as inspectors of property submitted to them for condemnation for which officers of organizations ordered to be mustered out of the service are responsible, and they are authorized to order, "by direction of the Secretary of War," final disposition to be made of condemned property, except that mentioned in paragraphs 888 and 1463 of the Regulations.

18. Officers of staff departments will be detailed for duty at rendezvous to receive public property and supervise the preparation of all returns and papers relating thereto under special instructions to be given by chiefs of the staff departments of the Army, and the Surgeon-General of the Army will designate for detail medical officers to assist in the physical examination of officers and men, to be made as indicated in Paragraph II of this order.

19. Officers of the Regular Army holding commissions in volunteer regiments will on muster out in the United States report by telegraph to the Adjutant-General of the Army for further orders.

20. Soldiers of volunteer organizations who at the time of the muster out of their organizations are in confinement under sentence of a general court-martial which does not provide for dishonorable discharge will be discharged without honor on the muster out of their commands, as provided for by paragraph 151, Army Regulations.

21. On arrival of the paymaster at the rendezvous the mustering officer will deliver to him the discharge certificates for the purpose indicated in section 6 of this order, and on the day of payment the organization will be paraded and the mustering officer will cause the names of all officers and enlisted men present and absent to be called out, requiring those present to answer and step briskly five paces in front of the line. As soon as the muster of a company has been completed the mustering officer will direct it to be marched to the pay table for payment and discharge, handing a copy of the muster-out roll to the company commander, which immediately after payment will be returned to the mustering officer. On completion of the payment of the organization the mustering officer will send one copy of the muster-out roll to the Adjutant-General of the Army and file the remaining copy with the records of the organization.

Mustering officers and their assistants will keep correct records of all correspondence, properly indexed, and upon completion of their duties render to the Adjutant-General of the Army full reports of their work with such recommendations as to the solution of the problem involved in the muster out of service of United States volunteers as their experience may dictate.

22. The Porto Rico Regiment, United States Volunteer Infantry, will be mustered out of the service at its station on or before June 30, 1901, under the provisions of this order and such special instructions as may be given from this office.

II. *Physical examination of officers and men.*—To facilitate the settlement of pension claims that may be made on account of disability incurred in the United States service and to protect the rights of persons who may be entitled to the benefits of the pension laws as well as to guard the interests of the Government, it is ordered that a thorough physical examination be made of all officers and enlisted men of volunteers, except general officers, officers of the general staff, and officers detached from the Regular Army immediately prior to their muster out of service or discharge. For this purpose a blank form will be supplied by the Adjutant-General of the Army.

1. When an organization is about to be mustered out of the service each officer and enlisted man will be required by his company or other commanding officer to answer the questions on the blank form "Declaration of person to be mustered out," which, when completed, will be signed by him and duly witnessed by said officer. This officer will then make the required certificate, which follows the declaration, based upon the official records of the organization and on his personal knowledge of the facts in the case.

2. When the physical examination papers of the officers and men of a company or other organization are so far completed, they will be given to the mustering officer, who will cause the physical examination to be made and said papers to be completed by a medical officer of the Army, Regular or Volunteer, detailed for this duty by proper authority.

3. Any officers or enlisted men under examination who claim to have a disability of which the medical officer can find no evidence, or claim to have a disability incurred in line of duty while the medical officer is of the opinion that the disability was not so incurred, will immediately be reexamined, without delaying discharge, by a board composed of not more than three medical officers, which will make a full report of the case in accordance with the terms of this order. If the medical officers fail to agree with regard to the case a separate minority report will be made by the dissenting officer. Should there be but one medical officer present the physical reexamination will be made by such other medical officer as may be available, otherwise the mustering officer will make such examination and express his opinion upon the merits of the case after inquiry and investigation of all pertinent information obtainable.

4. Upon completion of the medical examination the papers in the case will be turned over to the mustering officer, who will forward them with the muster-out rolls to the Adjutant-General of the Army.

5. The physical examination having been completed, the regimental and company records and blanks and the colors will be packed and marked, showing the organization to which they pertain, and forwarded to the Adjutant-General of the Army the day the muster out and payment takes place, as required by General Orders No. 128, series 1898, from this office. On the same day, or earlier, as may be deemed advisable by the mustering officer, the ordnance and other public property in possession of the organization will be turned over to the proper officers of the supply departments to be disposed of in accordance with the special instructions received by them.

By command of Lieutenant-General Miles:

H. C. CORBIN,
Adjutant-General.

GENERAL ORDERS, }
No. 22. }

HEADQUARTERS OF THE ARMY,
ADJUTANT-GENERAL'S OFFICE,
Washington, February 26, 1901.

The following orders of the Secretary of War are published for the information and government of all concerned:

Under the requirements of section 11 of the act approved February 2, 1901, "To increase the efficiency of the permanent military establishment of the United States," which provides that the enlisted force of the Corps of Engineers shall consist of one band and three battalions of four companies each, etc., the following organization is prescribed and will be effected without unnecessary delay:

The first battalion, to consist of Companies A, B, C, and D, will be organized at Manila, Philippine Islands, under the command and direction of such officer of the Corps of Engineers on duty in the Division of the Philippines as the commanding general of the division may designate.

The band and the second battalion, consisting of Companies E, F, G, and H, will take station at Fort Totten, Willets Point, N. Y.; the band will be organized and the battalion reorganized under the command and direction of the commanding officer of that station.

The designations of the present Companies E, C, and D of the Battalion of Engineers will be changed as follows:

Company E to Company C.

Company C to Company E.

Company D to Company F.

The third battalion, to consist of Companies I, K, L, and M, will, with the exception of Company M, be organized at Fort Totten, Willets Point, N. Y., under the direction of the officer commanding that station as soon as a sufficient number of men shall be available to effect an organization of the companies. Company M will be immediately organized at West Point, N. Y., with the detachment now there as a basis.

Recruiting will be at once commenced for the new companies to be organized and battalion commanders are authorized to transfer to them enlisted men of the old companies when in their opinion such transfers would be in the interests of the service. All such transfers will be promptly reported to the Adjutant-General of the Army.

The companies composing the first and second battalions will by authority of the President consist of the maximum strength authorized by the act, viz, 1 first sergeant, 1 quartermaster sergeant, 2 musicians, 2 cooks, 12 sergeants, 18 corporals, 64 first-class privates, and 64 second-class privates, each. The new companies composing the third battalion will be organized with the minimum strength authorized, viz, 1 first sergeant, 1 quartermaster-sergeant, 2 musicians, 2 cooks, 8 sergeants, 10 corporals, 38 first-class privates, and 38 second-class privates.

Officers will be assigned to the battalions in orders hereafter.

By command of Lieutenant-General Miles:

H. C. CORBIN,
Adjutant-General.

GENERAL ORDERS, }

No. 23.

HEADQUARTERS OF THE ARMY,
ADJUTANT-GENERAL'S OFFICE,
Washington, February 28, 1901.

I. By direction of the Secretary of War, the third provisional battalion of infantry now organizing at the Presidio of San Francisco is assigned as the First Battalion, Twenty-eighth U. S. Infantry, and will proceed to the Division of the Philippines on the transport *Indiana*, sailing from San Francisco about March 5, proximo.

The commanding general, Department of California, will complete the equipment and organization of the battalion, attach such officers as may be necessary for duty with it while en route to Manila, and arrange all other details of the organization and movement.

The Quartermaster's Department will furnish the transportation, the Subsistence Department suitable subsistence, and the Medical Department proper medical attendance and supplies.

II. By direction of the Secretary of War, the first provisional squadron of cavalry now organizing at the Presidio of San Francisco is assigned as the First Squadron, Fifteenth U. S. Cavalry, and will be prepared under the direction of the commanding general, Department of California, for early service in the Division of the Philippines.

By command of Lieutenant-General Miles:

H. C. CORBIN,
Adjutant-General.

GENERAL ORDERS, }

No. 25.

HEADQUARTERS OF THE ARMY,
ADJUTANT-GENERAL'S OFFICE,
Washington, February 28, 1901.

The following orders of the Secretary of War are published for the information and guidance of all concerned:

I. Under the provisions of section 9 of the act approved February 2, 1901, which requires that not less than 20 per cent of the increase authorized by the act for the artillery arm shall be made before July 1, 1901, twelve companies of coast artillery, in addition to those now in service, will be organized with the commissioned officers and at the stations hereinafter designated:

Fort Hamilton, N. Y., two companies:

The Eighty-third—

Captain, Warren P. Newcomb, now at Fort Hamilton, N. Y.

First lieutenant, _____.

Second lieutenant, Gordon Robinson, now at New York City.

The Eighty-fourth—

Captain, Oscar I. Straub, now at Fort Hamilton, N. Y.

First lieutenant, _____.

Second lieutenant, Richard Furnival, now at Jersey City, N. J.

Fort Wadsworth, N. Y., two companies:

The Eighty-fifth—

Captain, George W. Gatchell, now at Fort Wadsworth, N. Y.

First lieutenant, Malcolm Young, now at Key West Barracks, Florida

Second lieutenant, John A. Berry, now at Hackensack, N. J.

The Eighty-sixth—

Captain, Alfred M. Hunter, now at Fort Mott, N. J.

First lieutenant, _____.

Second lieutenant, Henry M. Dougherty, now at Englewood, N. J.

Fort Slocum, N. Y., one company, the Eighty-seventh—
 Captain, Edward F. McGilachlin, jr., now at Fort Sheridan, Ill.
 First lieutenant, Laurence C. Brown, now at Fort Monroe, Va.
 Second lieutenant, William Tidball, now at Montclair, N. J.

Fort Trumbull, Conn., one company, the Eighty-eighth—
 Captain, Peyton C. March.
 First lieutenant, Albert G. Jenkins, now at Fort Trumbull, Conn.
 Second lieutenant, Arthur H. Bryant, now at East Hartford, Conn.

Fort Banks, Mass., one company, the Eighty-ninth—
 Captain, Sidney S. Jordan, now at Washington Barracks, D. C.
 First lieutenant, _____.
 Second lieutenant, William S. Browning, now at Brooklyn, N. Y.

Fort McHenry, Md., one company, the Ninetieth—
 Captain, Wilnot E. Ellis, now at Fort Howard, Md.
 First lieutenant, Marcellus G. Spinks, now at Fort Monroe, Va.
 Second lieutenant, Dennis H. Currie, now at Washington, D. C.

Jackson Barracks, La., one company, the Ninety-first—
 Captain, John T. Martin, now at Jackson Barracks, La.
 First lieutenant, Robert E. Wyllie, now at Fort Morgan, Ala.
 Second lieutenant, Wildurr Willing, now at Hazelhurst, Miss.

The Presidio, San Francisco, Cal., one company, the Ninety-second—
 Captain, Edward Davis, now at the Presidio, Cal.
 First lieutenant, _____.
 Second lieutenant, Guy E. Carleton, now at Neosho, Mo.

Fort Stevens, Oreg., one company, the Ninety-third—
 Captain, John P. Hains, now at the Presidio, Cal.
 First lieutenant, _____.
 Second lieutenant, Alden F. Brewster, now at Delafield, Wis.

Fort Flagler, Wash., one company, the Ninety-fourth—
 Captain, Eugene T. Wilson, aid-de-camp to General Shafter.
 First lieutenant, _____.
 Second lieutenant, Raymond S. Pratt, now at Stillwater, Minn.

The additional companies will be organized as prescribed by the act of Congress approved March 2, 1899, and established by General Orders, No. 37, March 8, 1899, from this office, and will be filled by transfers and by recruitment to 109 enlisted men (81 privates) per company. One-half, as nearly as practicable, of the enlisted men of the present companies of coast artillery hereinafter designated will be transferred to the new companies by the respective post commanders, to take effect not later than April 15, 1901, and in carrying this order into effect each alternate sergeant, corporal, and private, as their names now appear on the muster rolls of the respective companies, will be selected for such transfer, together with one cook, one musician, and one mechanic.

Transfers to be made under the foregoing order:

Post.	From the—	To the—
Fort Hamilton, N. Y.....	Forty-ninth Company.....	Eighty-third Company.
Do	Fifty-fourth Company.....	Eighty-fourth Company.
Fort Wadsworth, N. Y.....	Fifty-third Company.....	Eighty-fifth Company.
Do	Fifty-seventh Company.....	Eighty-sixth Company.
Fort Slocum, N. Y.....	Eighty-first Company.....	Eighty-seventh Company.
Fort Trumbull, Conn.....	Second Company.....	Eighty-eighth Company.
Fort Banks, Mass.....	Seventy-sixth Company.....	Eighty-ninth Company.
Fort McHenry, Md.....	Thirty-ninth Company.....	Ninetieth Company.
Jackson Barracks, La.....	Fourth Company.....	Ninety-first Company.
The Presidio, San Francisco, Cal.....	Twenty-eighth Company.....	Ninety-second Company.
Fort Stevens, Oreg.....	Thirty-fourth Company.....	Ninety-third Company.
Fort Flagler, Wash.....	Twenty-sixth Company.....	Ninety-fourth Company.

The officers assigned to the companies to be organized will be at once relieved from their present duties, and will join their new stations and enter upon the duties devolving upon them without delay. The travel enjoined is necessary for the public service.

II. The officer commanding an artillery district has authority to appoint and reduce the noncommissioned staff officers, and, on the recommendation of their respective commanders, the noncommissioned officers of bands, batteries, and companies. Where artillery organizations are detached or not serving in an artillery district, the foregoing authority is vested in the commanding artillery officer.

The original records and books of the batteries and companies now in service will be continued, the change of designation being noted thereon. New record books will be supplied to additional batteries and companies when organized.

III. An additional artillery band will be organized, composed as heretofore authorized by law, for artillery regiments, by the commanding officer, Fort Columbus, New York Harbor, to be designated the Eighth Band, Artillery Corps, and will be stationed for the present at that post.

By command of Lieutenant-General Miles:

H. C. CORBIN,
Adjutant-General.

GENERAL ORDERS, }

No. 26.

HEADQUARTERS OF THE ARMY,
ADJUTANT-GENERAL'S OFFICE,
Washington, March 8, 1901.

The following act of Congress is published for the information and government of all concerned:

AN ACT making appropriation for the support of the Army for the fiscal year ending June thirtieth, nineteen hundred and two.

* * * * *

Provided further, That in fulfillment of the declaration contained in the joint resolution approved April twentieth, eighteen hundred and ninety-eight, entitled, "For the recognition of the independence of the people of Cuba, demanding that the Government of Spain relinquish its authority and government in the island of Cuba, and to withdraw its land and naval forces from Cuba and Cuban waters, directing the President of the United States to use the land and naval forces of the United States to carry these resolutions into effect," the President is hereby authorized to "leave the government and control of the island of Cuba to its people" so soon as a government shall have been established in said island under a constitution which, either as a part thereof or in an ordinance appended thereto, shall define the future relations of the United States with Cuba, substantially as follows:

I. That the government of Cuba shall never enter into any treaty or other compact with any foreign power or powers which will impair or tend to impair the independence of Cuba, nor in any manner authorize or permit any foreign power or powers to obtain by colonization or for military or naval purposes or otherwise, lodgment in or control over any portion of said island.

II. That said government shall not assume or contract any public debt, to pay the interest upon which, and to make reasonable sinking fund provision for the ultimate discharge of which, the ordinary revenues of the island, after defraying the current expenses of government shall be inadequate.

III. That the government of Cuba consents that the United States may exercise the right to intervene for the preservation of Cuban independence, the maintenance of a government adequate for the protection of life, property, and individual liberty, and for discharging the obligations with respect to Cuba imposed by the treaty of Paris on the United States, now to be assumed and undertaken by the government of Cuba.

IV. That all acts of the United States in Cuba during its military occupancy thereof are ratified and validated, and all lawful rights acquired thereunder shall be maintained and protected.

V. That the government of Cuba will execute, and as far as necessary extend, the plans already devised or other plans to be mutually agreed upon, for the sanitation of the cities of the island, to the end that a recurrence of epidemic and infectious diseases may be prevented, thereby assuring protection to the people and commerce of Cuba, as well as to the commerce of the southern ports of the United States and the people residing therein.

VI. That the Isle of Pines shall be omitted from the proposed constitutional boundaries of Cuba, the title thereto being left to future adjustment by treaty.

VII. That to enable the United States to maintain the independence of Cuba, and to protect the people thereof, as well as for its own defense, the government of Cuba will sell or lease to the United States lands necessary for coaling or naval stations at certain specified points, to be agreed upon with the President of the United States.

VIII. That by way of further assurance the government of Cuba will embody the foregoing provisions in a permanent treaty with the United States.

* * * * *

Provided, That appointments to fill original vacancies in the lowest grade in the Adjutant-General's Department, the Inspector-General's Department, and Judge-

Advocate-General's Department, and in the grade of captain in the Quartermaster's Department, Subsistence Department, and Pay Department may be made from officers of volunteers commissioned since April twenty-first, eighteen hundred and ninety-eight, and the age limit prescribed as to chaplains shall not apply to persons who served as chaplains of volunteers after said date who were under forty-two years of age when originally appointed.

* * * * *

For additional ten per centum increase on pay of officers serving at foreign stations, five hundred thousand dollars: *Provided*, That hereafter the pay proper of all officers and enlisted men serving beyond the limits of the States comprising the Union, and the Territories of the United States contiguous thereto, shall be increased ten per centum for officers and twenty per centum for enlisted men over and above the rates of pay proper as fixed by law for time of peace, and the time of such service shall be counted from the date of departure from said States to the date of return thereto. *Provided further*, That the officers and enlisted men who have served in China at any time since the twenty-sixth day of May, nineteen hundred, shall be allowed and paid for such service the same increase of pay proper as is herein provided for: *Provided further*, That enlisted men receiving or entitled to the twenty per centum increased pay herein authorized shall not be entitled to or receive any additional increased compensation for what is known as extra or special duty.

* * * * *

All military, civil, and judicial powers necessary to govern the Philippine Islands, acquired from Spain by the treaties concluded at Paris on the tenth day of December, eighteen hundred and ninety-eight, and at Washington on the seventh day of November, nineteen hundred, shall, until otherwise provided by Congress, be vested in such person and persons and shall be exercised in such manner as the President of the United States shall direct, for the establishment of civil government and for maintaining and protecting the inhabitants of said islands in the free enjoyment of their liberty, property, and religion: *Provided*, That all franchises granted under the authority hereof shall contain a reservation of the right to alter, amend, or repeal the same.

Until a permanent government shall have been established in said archipelago full reports shall be made to Congress on or before the first day of each regular session of all legislative acts and proceedings of the temporary government instituted under the provisions hereof; and full reports of the acts and doings of said government, and as to the condition of the archipelago and of its people, shall be made to the President, including all information which may be useful to the Congress in providing for a more permanent government: *Provided*, That no sale or lease or other disposition of public lands or the timber thereon or the mining rights therein shall be made: *And provided further*, That no franchise shall be granted which is not approved by the President of the United States, and is not in his judgment clearly necessary for the immediate government of the islands and indispensable for the interest of the people thereof, and which can not, without great public mischief, be postponed until the establishment of permanent civil government; and all such franchises shall terminate one year after the establishment of such permanent civil government.

All laws or parts of laws inconsistent with the provisions of this act are hereby repealed.

Approved, March 2, 1901.

By command of Lieutenant-General Miles:

H. C. CORBIN,
Adjutant-General.

GENERAL ORDERS, }
No. 30. }

HEADQUARTERS OF THE ARMY,
ADJUTANT-GENERAL'S OFFICE,
Washington, March 12, 1901.

I. By direction of the Secretary of War, the First Battalion, Thirtieth United States Infantry, will, under the direction of the commanding general, Department of California, be immediately organized at the Presidio of San Francisco from the infantry recruits now available at that post and prepared for early service in the Division of the Philippines.

II. By direction of the Secretary of War, the following-named troops heretofore designated for service in the Division of the Philippines will proceed from San Francisco, Cal., to Manila, Philippine Islands, as follows:

Company D, Tenth United States Infantry, in addition to First Battalion, Twenty-eighth United States Infantry, already ordered, on transport *Indiana*, sailing about the 15th instant.

Headquarters, band, and First and Third squadrons, Fifth United States Cavalry, and Troops A and B, Fifteenth United States Cavalry, on transport *Meade*, sailing about the 16th instant.

First and Third battalions (seven companies), Tenth United States Infantry, on transport *Pennsylvania*, sailing about the 18th instant.

The commanding general, Department of California, will arrange the details of the movements and report by telegraph to the Adjutant-General of the Army the hours of departures and strength of organizations.

The Quartermaster's Department will furnish the necessary transportation, the Subsistence Department suitable subsistence, and the Medical Department proper medical attendance and supplies.

By command of Lieutenant-General Miles:

H. C. CORBIN,

Adjutant-General, Major-General, United States Army.

GENERAL ORDERS, }
No. 31.

HEADQUARTERS OF THE ARMY,
ADJUTANT-GENERAL'S OFFICE,
Washington, March 13, 1901.

I. By direction of the Secretary of War, the headquarters of the Division of the Philippines will be designated by a standard of khaki-colored silk or bunting, measuring 3 feet on the staff and 4 feet 6 inches fly, cut swallow-tailed 12 inches to the fork, bearing in the center two circles overlapping each other, one-third radius, resembling the figure 8, 1 foot 6 inches high and of corresponding width. The symbol to be in red, bordered in white 1½ inches and edged in blue ¼ inch, surmounted by a red scroll bearing the device "Division of the Philippines" embroidered in blue letters.

Total length of lance to be 9 feet, including spearhead and ferrule.

II. By direction of the Secretary of War, paragraphs 928 and 937 of the Regulations are amended to read as follows:

928. Commanding officers will before forwarding charges personally investigate them and by indorsement on the charges will certify that they have made such investigation, and whether in their opinion the charges can be sustained. Before referring charges for which the maximum limit of punishment that may be awarded is greater than one month's forfeiture and confinement to inferior courts for trial, commanding officers will cause the accused to sign a statement on the original charges as to whether or not he consents to trial by summary court. A note of this statement in each case will also be entered on the record of the summary court and on the monthly report of trials by such court.

937. Whenever under the summary court act or the 83d Article of War it becomes necessary to convene a garrison or regimental court the order appointing it will state the facts which bring the cases to be tried within the exceptions of those laws.

By command of Lieutenant-General Miles:

H. C. CORBIN,

Adjutant-General, Major-General, United States Army.

GENERAL ORDERS, }
No. 37.

HEADQUARTERS OF THE ARMY,
ADJUTANT-GENERAL'S OFFICE,
Washington, March 20, 1901.

By direction of the Secretary of War, the telegraphic instructions to department commanders of the 18th instant, transferring the following-named troops to the Division of the Philippines and directing they be sent to San Francisco, Cal., in ample time to sail from there on the dates specified in each case, are confirmed:

First Infantry.—Third Battalion, from the Department of the Missouri; Companies K and L to sail on the transport *Kilpatrick* April 5, 1901; Companies I and M on the transport *Logan* April 15, 1901.

Fifth Infantry.—The lieutenant-colonel and second battalion, from the Department of the Lakes, to sail on the transport *Buford* April 1, 1901. This battalion will be filled, as nearly as practicable, to the maximum by assignment of recruits and by voluntary transfers from the Twenty-ninth United States Infantry.

Seventh Infantry.—Companies C and M, from the Department of the Columbia; Company D, from the Department of the Colorado; and Company H, from the Department of California, to sail on the transport *Hancock* March 25, 1901.

Eleventh Infantry.—Headquarters, field, staff, band, and first and third battalions from the Department of the East; headquarters, field, staff, band, and third battalion to sail on the transport *Kilpatrick* April 5, 1901; the first battalion on the transport *Logan* April 15, 1901.

Sixth Cavalry.—Second squadron, Troops E and H, from the Department of the Columbia, and Troops F and G, from the Department of California, to sail on the transport *Hancock* March 25, 1901.

Ninth Cavalry.—Third squadron, from the Department of the Colorado, to sail on the transport *Logan* April 15, 1901.

Tenth Cavalry.—Second squadron, from the Department of Texas, to sail on the transport *Logan* April 15, 1901.

Fifteenth Cavalry.—Troops C and D, from the Department of California, to sail on the transport *Buford* April 1, 1901.

Troops and companies will, as far as practicable, be filled to the maximum by assignment of recruits or transfers. Officers and men unfit for active service, and enlisted men who have three months or less to serve and who have not signified their intention to reenlist, will be left at stations; noncommissioned officers left behind will not be reduced in consequence thereof.

Department commanders will by concert of action arrange details of movements, provide troops temporarily for posts which would be left without sufficient garrisons, and report hours of departure and arrival and strength of commands by telegraph to the Adjutant-General of the Army.

Company commanders will make every proper effort to induce enlisted men going to the Philippine Islands who have relatives dependent upon them to make allotments of pay, as provided for in General Orders, No. 149, August 17, 1899, from this office, reporting their names to the Adjutant-General of the Army.

Property left behind by the troops will be securely packed, marked, and listed in duplicate.

The Quartermaster's Department will furnish the necessary transportation, the Subsistence Department suitable subsistence, and the Medical Department proper medical attendance and supplies.

By command of Lieutenant-General Miles:

H. C. CORBIN,
Adjutant-General, Major-General, United States Army.

GENERAL ORDERS, }
No. 50. }

HEADQUARTERS OF THE ARMY,
ADJUTANT-GENERAL'S OFFICE,
Washington, April 9, 1901.

By direction of the Secretary of War, the following order from the War Department is published to the Army for the information and guidance of all concerned:

WAR DEPARTMENT, Washington, April 9, 1901.

Pursuant to section 6 of the act of February 2, 1901, entitled "An act to increase the efficiency of the permanent military establishment of the United States," the duties of the chief of artillery are hereby prescribed:

1. He shall keep the Commanding General of the Army, and through him the Secretary of War, advised at all times of the efficiency of the personnel and materiel of the artillery, and make such recommendations in reference thereto as shall in his judgment tend to promote efficiency.

2. He shall annually, and as frequently as circumstances shall require, inspect the coast and field artillery, and he shall from time to time, and as frequently as once in each year, report to the Commanding General, and through him to the Secretary of War, as to each coast-defense fortification, whether the same is in all respects ready for use in case of attack, and if not, in what respects the preparations are defective.

3. He shall from time to time, and as frequently as conditions require, confer directly with the Chief of Ordnance, and advise him of all matters relating to the character and preparation of artillery materiel which the experience and observation of the artillery arm of the service show to be of practical importance.

4. He shall have general supervision of the instruction of artillery officers and men and of examinations for promotion and for appointments and transfers of officers to the artillery arm, and shall recommend such examinations and such courses and methods of instruction in the artillery schools and otherwise as he shall deem requisite to secure a thoroughly trained and educated force.

5. He shall recommend officers for duty in coast or field artillery according to special aptitude and fitness, and is charged generally with the recommendation of officers of artillery for special duty.

6. Before any money is expended or any land is acquired for any seacoast fortification hereafter he shall advise the Secretary of War, through the Commanding General, whether the project under which the expenditure is to be made includes adequate provision for all the different elements of a complete coast-defense establishment, including fortification, armament, and accommodations for the use of troops; whether the land which it is proposed to acquire will be sufficient for all the purposes mentioned, and how far the appropriations available provide for the entire work. For that purpose all projects and plans for coast-defense fortifications shall upon coming into the office of the Secretary of War be referred as of course in the first instance to the Chief of Artillery for his report thereon.

7. He shall be a member of the Board of Ordnance and Fortification.

8. The records pertaining to the performance of the duties of the Chief of Artillery will be kept in the office of the Adjutant-General of the Army, through whom all communications relating to personnel, discipline, efficiency, transfers, and assignments should be made, in accordance with existing regulations.

9. Nothing in these regulations shall be deemed to relieve the commanders of the several military departments of the duties of inspection and command, or of responsibility for the condition and efficiency of the materiel and personnel of the artillery in their several departments, as now provided by regulations.

ELIHU ROOT,
Secretary of War

By command of Lieutenant-General Miles:

H. C. CORBIN,
Adjutant-General, Major-General, United States Army.

GENERAL ORDERS, }
No. 52.

HEADQUARTERS OF THE ARMY,
ADJUTANT-GENERAL'S OFFICE,
Washington, April 17, 1901.

I. By direction of the Secretary of War, the following paragraphs are added to the Regulations:

TRAVEL ALLOWANCES.

1321½. Actual expenses only will be paid to officers for sea travel when traveling to, from, or between our island possessions. An itemized statement of such expenses will be filed with each voucher for payment as follows:

1. Fares upon commercial steamers, steamship lines, or other usual modes of conveyance by sea.

2. Cost of customary stateroom accommodations on commercial steamers when the same is not included in the travel fare.

3. Hire of special water transportation when there are no regular means of conveyance.

4. Actual cost of meals, not to exceed \$4.50 per day, for the time actually and unavoidably consumed in the voyage when the same is not included in the travel fare. Actual cost of meals on Government transports. A reasonable fee to cabin and stateroom stewards will be allowed on commercial lines of steamers; the payment of such fees on Government transports is not authorized. Subvouchers, properly receipted, will be required for the above items when the total cost exceeds \$1. When not practicable to obtain such subvouchers the officer will so certify.

CONTRACT DENTAL SURGEONS.

1395½. Candidates for appointment as dental surgeons must be not less than twenty-four nor more than forty years of age. They must be graduates of standard medical colleges, trained in the several branches of dentistry, of good moral and professional character, and prior to appointment will be required to pass a satisfactory professional examination before a board of dental surgeons convened for that purpose by the Secretary of War.

Contracts with dental surgeons will be made for three years, but may be annulled at any time by the commanding general of a military department, after official investigation, for conduct to the prejudice of good order and military discipline, or by the Surgeon-General when in his opinion a termination of the contract would be in the interests of the service.

Dental surgeons are attached to the medical department and will be assigned to duty in accordance with the recommendations of the Surgeon-General of the Army or the chief surgeon of a military department.

A dental surgeon when assigned to a station will apply to the post commander for a suitable operating room. If no other room is available, the surgeon of the post may assign him a room in the hospital.

Each dental surgeon will ordinarily be allowed one enlisted man as an assistant, who will be detailed from the acting hospital stewards or privates of the Hospital Corps, and whose duty it will be to assist the dentist in his operations, in caring for the instruments and other public property, in keeping the records, and in the performance of such other official work pertaining to this position as he may be directed by the proper authority to do. When a member of the Hospital Corps is detailed as dentist's assistant he will receive commutation of rations at the rate of \$1 daily, and will be provided with a suitable room as quarters by the Quartermaster's Department, except while on duty at a post, when he will be attached to the Hospital Corps or other organization for rations and quarters.

Necessary dental instruments and supplies will be purchased by medical supply officers under instructions from the Surgeon-General and in accordance with a supply table to be approved by the Secretary of War.

Dental surgeons will be held strictly responsible for all instruments and supplies issued to them and will be governed by army regulations and orders now in force, or hereafter to be issued, with reference to accountability for Government property.

In accordance with the act of Congress authorizing their employment, dental surgeons will "serve the officers and enlisted men of the Regular and Volunteer Army." The families of officers and civilian employees attached to the Army are not entitled to their services. In this connection acting assistant surgeons are to be regarded as commissioned officers.

Dental surgeons will operate between the hours of 9 a. m. and 4 p. m. only upon those officers and enlisted men who are entitled to their services. They may operate upon others not entitled to free service before and after these hours when their services are not required by those entitled to them, but material issued to them by the Government will only be used in operations upon officers and enlisted men of the Army.

Dental surgeons will not perform any operation upon officers or enlisted men of the Army or prescribe medicines for them other than those necessary for the treatment of the teeth and gums. This prohibition does not apply to cases of emergency where no medical officer is within reach, and where a dental surgeon is able to render the necessary surgical assistance to meet the immediate emergency.

Emergency work whether for officers or enlisted men should always have precedence. Plate work or restoration of teeth by any method will only be done for those who have lost teeth in the service and in the line of duty. For plate work or filling teeth only the cheaper materials will be supplied, but gold may be used, if the operating dentist sees fit to use it, at the expense of the individual operated upon.

Enlisted men requiring the services of the dental surgeon will, at an hour prescribed by the commanding officer, be conducted to the designated place under a noncommissioned officer, who will take with him and hand to the dentist a list of those reporting for treatment. This list will be entered in a daybook, ruled in column for surname, given name, rank, company, regiment, etc.; all headings to be the same as those borne on his monthly report.

All cases requiring treatment involving future appointment will be so noted, and the others will be marked according to the circumstances, as "treatment unnecessary," "further treatment unnecessary," "should be sent to the surgeon," etc. When future treatment is necessary the dentist will forward a card as follows:

The ADJUTANT,

SIR: I have the honor to ask that _____ be directed to report to me from _____ to _____ on _____ instant for treatment.

Very respectfully,

_____,
Dental Surgeon.

Dental surgeons will submit a monthly report in duplicate (on prescribed blanks) of all official work done by them, giving all required data in every case in which professional services have been rendered. This report will be an exact copy of the register kept for the period. One copy will be sent on the last day of the month to the Surgeon-General and one to the chief surgeon of the department in which the dental surgeon is serving.

II. By direction of the Secretary of War, paragraph 511 of the Regulations is amended to read as follows:

"511. Vouchers covering bills for printing for department headquarters will, prior to payment, be submitted to the Secretary of War, except for printing done in the Philippine Islands or in foreign countries near thereto, where they will be subject to the approval of the commanding general of the division, or of the department in case there be no division. They will be made out on prescribed forms, the printing to be so described as to enable computations to be readily reviewed according to the customary methods in use among book and job printers. A sample of the printing will accompany each bill and on vouchers for work classed as 'special' in the circular of instructions the number of copies and rate per hundred will be stated, and on vouchers for other jobs the date of printing, number of copies, name and amount of type (number of thousand ems), number of tokens of press work, and rates per thousand ems and per token will be stated. The voucher will show grade and quantity of paper furnished by the printer and price charged. The vouchers thus prepared with the certificate of the officer ordering the work as to its necessity and propriety will be forwarded direct to the chief clerk of the War Department, with a letter of transmittal describing the inclosures, except for printing done in the Philippine Islands or in foreign countries near thereto, in which case the vouchers will be transmitted to the division commander."

By command of Lieutenant-General Miles:

H. C. CORBIN,
Adjutant-General, Major-General, United States Army.

GENERAL ORDERS, }
No. 53.

HEADQUARTERS OF THE ARMY,
ADJUTANT-GENERAL'S OFFICE,
Washington, April 18, 1901.

I. By direction of the Secretary of War, paragraph 26, page 26, of the Regulations and Decisions pertaining to the Uniform of the Army of the United States, fourth edition, 1900, is amended to read as follows:

"UNIFORM OF CONTRACT SURGEONS AND CONTRACT DENTAL SURGEONS.

"26. Contract surgeons may wear the undress and field uniform of an assistant surgeon with the rank of first lieutenant, the shoulder straps and ornaments to be in silver instead of gold.

Contract dental surgeons will be permitted to wear the undress and field uniform of an assistant surgeon with the rank of first lieutenant, the straps and ornaments to be in silver instead of gold, and block letters "D.S." in silver embroidery to be placed between the bars of the shoulder straps."

II. By direction of the Secretary of War, the following paragraph is added to the Regulations and Decisions pertaining to the Uniform of the Army, fourth edition, 1900:

UNIFORM OF VETERINARIANS.

26½. Veterinarians will wear the undress and field uniform of a second lieutenant of cavalry or artillery, according to arm of service, omitting the shoulder straps; collar and shoulder ornaments to be of white metal.

* * * * *

By command of Lieutenant-General Miles:

H. C. CORBIN,
Adjutant-General, Major-General, United States Army.

GENERAL ORDERS, }
No. 56.

HEADQUARTERS OF THE ARMY,
ADJUTANT-GENERAL'S OFFICE,
Washington, April 23, 1901.

I. The following order of the President is, by direction of the Secretary of War, published for the information and guidance of all concerned:

EXECUTIVE MANSION,
Washington, March 26, 1901.

In accordance with the provisions of section 40 of the act entitled "An act to increase the efficiency of the permanent military establishment of the United States,"

approved February 2, 1901, which authorizes the President to "prescribe the kinds and quantities of the component articles of the army ration, and to direct the issue of substitutive equivalent articles in place of any such components whenever, in his opinion, economy and a due regard to the health and comfort of the troops may so require," the following is promulgated for the information and guidance of all concerned:

The kinds and quantities of articles composing the army ration and the substitutive equivalent articles which may be issued in place of such components shall be as follows:

1. *For troops in garrison (garrison ration).*

	Standard articles.		Substitutive articles.	
	Kinds.	Quantities.	Kinds.	Quantities.
Meat components.....	Fresh beef.....	20 ounces.....	Fresh mutton ¹	20 ounces.
			Bacon.....	12 ounces. ²
			Canned meat ³	16 ounces.
			Dried fish.....	14 ounces.
			Pickled fish.....	14 ounces.
Bread components.....	Flour.....	18 ounces.....	Canned fish.....	16 ounces.
			Soft bread.....	18 ounces.
			Hard bread ⁴	16 ounces.
			Corn meal.....	20 ounces.
			Pease.....	24 ounces.
Vegetable components ⁵	Beans.....	24 ounces.....	Rice.....	14 ounces.
			Hominy.....	14 ounces.
	Potatoes.....	16 ounces.....	Potatoes.....	124 ounces.
			Onions.....	34 ounces.
			Potatoes.....	124 ounces.
			Canned tomatoes.....	84 ounces.
			Potatoes.....	114 ounces.
Dried (or evaporated) fruit components. ⁶	Prunes.....	14 ounces.....	Fresh vegetables, not canned. ⁷	44 ounces.
			Dedicated vegetables ⁸	24 ounces.
			Apples.....	14 ounces.
Coffee and sugar components	Coffee, green ..	14 ounces.....	Peaches.....	14 ounces.
	Sugar.....	34 ounces.....	Roasted and ground.....	14 ounces.
Seasoning components.....	Vinegar.....	4 gill.....	Tea, black or green.....	4 ounce.
	Salt.....	4 ounce.....	Vinegar.....	4 gill.
	Pepper, black.....	4 ounce.....	Cucumber pickles.....	4 gill.
Soap and candle components	Soap.....	4 ounce.....		
	Candles ⁹	4 ounce.....		

¹ When the cost does not exceed that of fresh beef.

² In Alaska 16 ounces of bacon, or, when desired, 16 ounces of salt pork, or 22 ounces salt beef.

³ When impracticable to furnish fresh meat.

⁴ To be ordered issued only when impracticable to use flour or soft bread.

⁵ In Alaska the allowance of fresh vegetables will be 24 ounces instead of 16 ounces.

⁶ When they can be obtained in the vicinity or transported in a wholesome condition from a distance.

⁷ When impracticable to furnish fresh vegetables. In Alaska 34 ounces instead of 24 ounces.

⁸ Thirty per cent of the issue to be prunes when practicable.

⁹ When illumination is not furnished by the Quartermaster's Department. In Alaska 44 ounce instead of 44 ounce.

2. *For troops in the field in active campaign (field ration).*

	Standard articles.		Substitutive articles.	
	Kinds.	Quantities.	Kinds.	Quantities.
Meat components	Fresh beef ¹	20 ounces ..	Fresh mutton ¹	20 ounces.
			Canned meat ²	16 ounces.
			Bacon	12 ounces.
			Soft bread	18 ounces.
			Hard bread	16 ounces.
Bread components	Flour	18 ounces ..	Hops ⁴	$\frac{1}{4}$ ounce.
	Baking powder ³	$\frac{1}{4}$ ounce.....	Dried or compressed yeast ⁴	$\frac{1}{4}$ ounce.
	Beans	2 $\frac{1}{2}$ ounces ..	Rice	1 $\frac{1}{2}$ ounces.
			Potatoes ¹	12 $\frac{1}{2}$ ounces.
Vegetable components			Onions ¹	3 $\frac{1}{2}$ ounces.
	Potatoes ¹	16 ounces ..	Desiccated potatoes	2 $\frac{1}{2}$ ounces.
			Desiccated potatoes	1 $\frac{1}{2}$ ounces.
			Desiccated onions	$\frac{1}{4}$ ounce.
			Desiccated potatoes	1 $\frac{1}{2}$ ounces.
			Canned tomatoes	3 $\frac{1}{2}$ ounces.
Fruit component.....	Jam	1 $\frac{1}{2}$ ounces ..		
Coffee and sugar components.	Coffee, roasted and ground.	1 $\frac{1}{2}$ ounces ..	Tea, black or green.....	$\frac{1}{4}$ ounce.
	Sugar	3 $\frac{1}{2}$ ounces ..		
	Vinegar	$\frac{1}{4}$ gill	Vinegar	$\frac{1}{4}$ gill.
Seasoning components	Salt	$\frac{1}{4}$ ounce	Cucumber pickles	$\frac{1}{4}$ gill.
	Pepper, black	$\frac{1}{4}$ ounce		
Soap and candle components.	Soap	$\frac{1}{4}$ ounce		
	Candles	$\frac{1}{4}$ ounce		

¹ When procurable locally.² When fresh meat can not be procured locally.³ When ovens are not available.⁴ When ovens are available.3. *For troops when traveling otherwise than by marching or when for short periods they are separated from cooking facilities (travel ration).*

Standard articles.		Substitutive articles.	
Kinds.	Quantities per 100 rations.	Kinds.	Quantities per 100 rations.
Soft bread.....	112 $\frac{1}{2}$ pounds	Hard bread.....	100 pounds.
Canned corned beef.....	75 pounds	Corned beef hash	75 pounds.
Baked beans	25 pounds		
Canned tomatoes.....	50 pounds		
Coffee, roasted and ground.....	8 pounds		
Sugar.....	15 pounds		

4. *For troops traveling on vessels of the United States Army transport service.*

Food on transports for troops traveling will be prepared from the articles of subsistence stores which compose the ration for troops in garrison, varied by the substitution of other articles of authorized subsistence stores of equal money value when required. No savings will be allowed to troops on transports.

5. *For use of troops on emergent occasions in active campaign (emergency ration).*

An emergency ration, prepared under direction of the War Department, will be issued to troops on active campaign, but will not be used at any time or place where regular rations are obtainable. It will be packed in a conveniently shaped package, and will be carried in the haversack or saddlebags and accounted for at inspection, etc., by the soldier.

6. *Proportions of meat issues.*

Fresh meats will ordinarily be issued seven days in ten and salt meats three days in ten. If fish (dried, pickled, or canned) is issued it will be in substitution of salt meat. The proportions of the meat issues may be varied at the discretion of department commanders, not, however, without due consideration being given to the equitable rights of contractors engaged in furnishing fresh meats to the troops under their commands.

7. *Substitute when the issue of both fresh meat and vegetables is impracticable.*

Whenever the issue of both the fresh meat and vegetable components is impracticable, there may be issued in lieu of them canned fresh-beef-and-vegetable stew, at the rate of 28½ ounces to the ration.

WILLIAM MCKINLEY.

II. By direction of the Secretary of War, paragraphs 1251, 1252 as amended by G. O., No. 106, of 1898, from this Office, 1253 as amended by G. O., No. 78, of 1899, from this Office, 1254, 1255, and 1256 as amended by G. O., No. 6, January 12, 1900, from this Office, of the Regulations are revoked, and the following paragraphs, numbered 1251, 1252, 1253, 1254, 1255, 1256, 1256a, 1256b, 1256c, and 1256d, are inserted in place thereof:

" THE RATION.

" 1251. A ration is the allowance for the subsistence of one person for one day, and varies in components according to the station of the troops or the nature of the duty performed, being severally known as the garrison ration, the field ration, the travel ration, and the emergency ration. The garrison ration is issued to troops in garrison or in permanent camps; the field ration to troops in the field in active campaign; the travel ration to troops traveling otherwise than by marching or when for short periods they are separated from cooking facilities; and the emergency ration to troops in active campaign for use on emergent occasions.

" 1252. Enlisted men, hospital matrons, nurses in the Nurse Corps (female), general prisoners of war, and military prisoners at posts are each entitled to one ration in kind per day according to the station or the nature of the service, except that nurses are not entitled to rations while traveling; and when the rate of pay of a civilian employed with the Army does not exceed \$60 per month, and the circumstances of his service make it necessary, and the terms of his engagement provide for it, there may be issued to him one garrison or field ration in kind per day according to the exigencies of the case.

" 1253. The kinds and quantities of articles composing the garrison ration, the field ration, and the travel ration, and the quantities computed for 100 rations, are as follows:

" 1. *Garrison ration.*

Articles.	Quantities per ration.			Quantities per 100 rations.	
	Oz.	Galls.	Lbs.	Oz.	Galls.
MEAT COMPONENTS.					
Fresh beef.....	20		125		
Or fresh mutton, when the cost does not exceed that of beef.....	20		125		
Or bacon.....	112		76		
Or canned meat, when impracticable to furnish fresh meat.....	16		100		
Or dried fish.....	14		87	8	
Or pickled fish.....	18		112	8	
Or canned fish.....	16		100		
BREAD COMPONENTS.					
Flour.....	18		112	8	
Or soft bread.....	18		112	8	
Or hard bread, to be ordered issued only when impracticable to use flour or soft bread.....	16		100		
Or corn meal.....	20		125		
VEGETABLE COMPONENTS.¹					
Beans.....	2½		15		
Or peas.....	2½		15		
Or rice.....	1½		10		
Or hominy.....	1½		10		
Potatoes.....	16		100		
Or potatoes, 12½ ounces, and onions, 3½ ounces.....	16		100		
Or potatoes, 12½ ounces, and canned tomatoes, 3½ ounces.....	16		100		
Or potatoes, 11½ ounces, and other fresh vegetables (not canned), 4½ ounces, when they can be obtained in the vicinity, or transported in a wholesome condition from a distance.....	16		100		
Or desiccated vegetables, ² when impracticable to furnish fresh vegetables.....	2½		15		
FRUIT COMPONENT.					
Dried or evaporated fruits (prunes, apples, or peaches, 30 per cent of the issue to be prunes when practicable).....	1½		10		

¹ In Alaska, 16 ounces bacon, or, when desired, 16 ounces salt pork or 22 ounces salt beef.

² In Alaska the allowance of fresh vegetables will be 24 ounces instead of 16 ounces.

³ In Alaska, 3½ ounces instead of 2½ ounces.

1. Garrison ration—Continued.

Articles.	Quantities per ration.		Quantities per 100 rations.		
	Oz.	Galls.	Lbs.	Oz.	Galls.
COFFEE AND SUGAR COMPONENTS.					
Coffee, green	1½		10		
Or roasted and ground coffee	1½		8		
Or tea, black or green	¾		2		
Sugar	3½		20		
SEASONING COMPONENTS.					
Vinegar		½			1
Or vinegar, ¾ gill, and cucumber pickles, ¾ gill		½			1
Salt	½		4		
Pepper, black	½			4	
SOAP AND CANDLE COMPONENTS.					
Soap	½		4		
Candles, ¹ when illumination is not furnished by the Quarter-master's Department	½		1	8	

¹ In Alaska, ¾ ounce instead of ½ ounce.

2. Field ration.

Articles.	Quantities per ration.		Quantities per 100 rations.		
	Oz.	Galls.	Lbs.	Oz.	Galls.
MEAT COMPONENTS.					
Fresh beef or mutton, when procurable locally	20		125		
Or canned meat, when fresh meat can not be procured locally	16		100		
Or bacon	12		75		
BREAD COMPONENTS.					
Flour	18		112	8	
Or soft bread	18		112	8	
Or hard bread	16		100		
Baking powder, when ovens are not available	½		4		
Or hops, when ovens are available	½			2	
Or dried or compressed yeast, when ovens are available	½			4	
VEGETABLE COMPONENTS.					
Beans	2½		15		
Or rice	1½		10		
Potatoes, when procurable locally	16		100		
Or potatoes, 12½ ounces, and onions, 3½ ounces, when procurable locally	16		100		
Or desiccated potatoes	2½		15		
Or desiccated potatoes, 1½ ounces, and desiccated onions, ½ ounce	2½		15		
Or desiccated potatoes, 1½ ounces, and canned tomatoes, 3½ ounces	5½		32		
FRUIT COMPONENT.					
Jam, in cans	1½		8	12	
COFFEE AND SUGAR COMPONENTS.					
Coffee, roasted and ground	1½		8		
Or tea, black or green	¾		2		
Sugar	3½		20		
SEASONING COMPONENTS.					
Vinegar		½			1
Or vinegar, ¾ gill, and cucumber pickles, ¾ gill		½			1
Salt	½		4		
Pepper, black	½			4	
SOAP AND CANDLE COMPONENTS.					
Soap	½		4		
Candles	½		1	8	

3. *Travel ration.*

Articles.	Per 100 rations.
	<i>Pounds.</i>
Soft bread	112½
Or hard bread.....	100
Canned corned beef, or corned-beef hash.....	75
Baked beans	25
Canned tomatoes.....	50
Coffee, roasted and ground.....	8
Sugar.....	15

1254. Food on transports for troops traveling will be prepared from the articles of subsistence stores which compose the ration for troops in garrison, varied by the substitution of other articles of authorized subsistence stores of equal money value when required. No savings will be allowed to troops on transports.

1255. Troops in active campaign will be supplied with an emergency ration prepared under direction of the War Department, which will not be used at any time or place where regular rations are obtainable. It will be carried in the haversack or saddlebags and accounted for at inspection, etc., by the soldier. It will not be opened except by order of an officer or in extremity. If improperly opened or lost, the money value will be charged against the soldier.

1256. Fresh meats will ordinarily be issued seven days in ten and salt meats three days in ten. If fish (dried, pickled, or canned) is issued it will be in substitution of salt meat. The proportion of the meat issues to troops may be varied at the discretion of department commanders, not, however, without due consideration being given to the equitable rights of contractors engaged in furnishing fresh meats to the troops under their commands. Whenever the issue of both the fresh meat and vegetable components is impracticable, there may be issued in lieu of them canned fresh beef and vegetable stew, at the rate of 28½ ounces to the ration. The meat component to which the sick in hospital drawing rations in kind are entitled may, at the discretion of the medical officer, be called for and issued wholly in fresh beef, or partly in fresh beef and partly in salt meats.

1256a. When troops are not supplied with fresh or desiccated vegetables in kind by a commissary, or when, under paragraph 314, the troops raise vegetables for their own use in post gardens and such use does not prejudice the interests of any contractor under his contract for supplying fresh vegetables to the post, commutation of the fresh vegetable portion of their rations will be allowed by the commissary at the prices of potatoes and onions in the vicinity of the post or in the market from which the post is supplied, in the proportion of 80 per cent of potatoes and 20 per cent of onions, the commutation prices being determined monthly by the chief commissary of the department in which the post is situated. Where the raising of vegetables in a post garden is contemplated, the post commissary, with the approval of the post commander, will notify the chief commissary of the period during which the post garden will be relied upon for vegetables, and that period will be excepted from the operation of any contract that may be made for supplying vegetables to the post.

1256b. At posts and stations where illumination is furnished by the Quartermaster's Department, candles are not issued as part of the ration except to individuals whom it is not practicable for that Department to supply with illuminants.

1256c. When troops supplied with travel rations arrive at their destination or rejoin their station, such of the travel rations furnished them in excess of the time actually consumed by the journey as may be in good condition will be turned in to the commissary in exchange for the regular ration, and subsistence upon the latter will thereupon be immediately resumed.

1256d. In adjusting charges to be made against enlisted men or others on account of increased expense to the Government for their subsistence, the value of the garrison or field ration will be estimated at 20 cents each, and that of travel ration at 40 cents.

III. By direction of the Secretary of War, paragraph 1259 of the regulations is amended to read as follows, and a paragraph will be inserted as paragraph 1259a, as follows:

"1259. The ration as issued to troops will be issued on ration returns signed by the medical officer in charge and approved by the commanding officer, to the Hospital Corps, the hospital matrons, the nurses of the Nurse Corps, and to such patients in hospital as can be subsisted on the ration as ordinarily issued.

"1259a. The medical officer in charge of a general, post, or camp hospital, hospital ship, or transport carrying patients is authorized to purchase, under the laws and regulations relating to purchases of subsistence stores, such articles of food, both solid and liquid, not carried in stock by the subsistence officer who issues rations to the hospital, and to call upon such subsistence officer for the issue of such quantities of articles from the stock already on hand as in the judgment of the medical officer are required for the diet of enlisted patients under his charge who are too sick to be subsisted on the ration as ordinarily issued; the total combined money value of the stores hereby authorized to be purchased and issued as above in any month not to exceed the rate, calculated on the month's transactions, of 40 cents per man per day for those actually requiring special diet. Subsistence officers are authorized to pay all duly certified bills of purchases made by medical officers under the provisions of this paragraph, or to make the purchases themselves at the request of the medical officers, and to make issues for special diet hereunder from stores on hand at their request, provided the rate of 40 cents per man per day for those enlisted men actually requiring special diet is not exceeded in any month."

IV. By direction of the Secretary of War, paragraphs 1269 and 1277 of the regulations are amended to read as follows:

"SAVINGS.

"1269. All articles of the ration (excepting fresh beef, dried or pickled fish, soft bread, fresh, or desiccated vegetables, and dried fruit) due a company, bakery, or other military organization not needed for consumption will, if public loss will not result, be retained for reissue by the commissary, and will be paid for by him as savings at the invoice prices. The entering of a more expensive component article of the ration on the ration return with the view of leaving it undrawn and selling it to the commissary as savings and purchasing from him for use in its place a less expensive article of the same component is prohibited. Savings not needed by the commissary for reissue may be sold by companies, bakeries, or other organizations to any purchasers."

"1277. When an officer orders commutation of rations to be paid, or rations to be issued, to a soldier on furlough to enable him to reach his proper station, the paying or issuing officer will report the full amount paid, or the money value of the issue, to the soldier's company commander. Should the soldier reach his station on or before the last day of his furlough, the company commander will charge the full amount of the payment or issue against his pay on the next muster and pay roll. Should he reach his post after the expiration of his furlough, and the delay be not excused, the full amount will be similarly charged. Should the over staying of his furlough be excused, the full amount, diminished by the value of the ration, at 20 cents per day, for the number of days during which he was absent after the furlough had expired, will be charged."

V. By direction of the Secretary of War, paragraph 58 of the Subsistence Manual is amended to read as follows:

"58. Where the exact quantity of canned meats, canned tomatoes, or canned baked beans to which a company or detachment is entitled can not be furnished without breaking a can, an overissue of one can of the smallest size on hand will be allowed. Trade packages of canned baked beans being of varying weights, contents of cans will be estimated as follows in making issues:

"So-called 1-pound cans, 10½ ounces; 3-pound cans, 34½ ounces."

By command of Lieutenant-General Miles:

H. C. CORBIN,

Adjutant-General, Major-General, United States Army.

GENERAL ORDERS, }
No. 57.

HEADQUARTERS OF THE ARMY,
ADJUTANT-GENERAL'S OFFICE,
Washington, April 24, 1901.

I. By direction of the Secretary of War, the following is published to the Army for the information and guidance of all concerned:

The act of Congress making appropriations for the support of the Army, etc., approved March 2, 1901 (published in General Orders, No. 26, March 8, 1901, from this office), provides as follows:

"That any officer or enlisted man in the service of the United States who was discharged in the Philippine Islands and there reentered the service through commission or enlistment shall, when discharged, except by way of punishment for an offense,

receive for travel allowances from the place of his discharge to the place in the United States of his last preceding appointment or enlistment, or to his home if he was appointed or enlisted at a place other than his home, four cents per mile: *Provided further*, That for sea travel on discharge actual expenses only shall be paid to officers and transportation and subsistence only shall be furnished to enlisted men."

In order that officers and enlisted men entitled to the benefits conferred by the foregoing provisions of the act may receive the same, the places in the United States of last appointment or enlistment preceding their discharge in the Philippine Islands in the cases of volunteers will be noted on the muster-out rolls of the organization to which they belong and on the final statements, and in the cases of enlisted men of the Regular Army on their final statements.

II. By direction of the Secretary of War, paragraph 220 of the Regulations is amended to read as follows:

"SERVICE COLORS AND STANDARDS.

"220. A national color made of hunting or other suitable material, but in all other respects similar to the silken national color, will be furnished to each battalion of engineers and to each regiment of infantry for use at drills and on marches and all service other than battles, campaigns, and occasions of ceremony. A similar color of the same dimensions as the silken standard will be furnished for like purposes to each regiment of cavalry."

By command of Lieutenant-General Miles:

H. C. CORBIN,

Adjutant-General, Major-General, United States Army.

GENERAL ORDERS, }
No. 58.

HEADQUARTERS OF THE ARMY,
ADJUTANT-GENERAL'S OFFICE,
Washington, April 25, 1901.

By direction of the Secretary of War, sections 1 and 5 of paragraph 1395, added to the regulations by Paragraph I, General Orders, No. 52, April 17, 1901, from this office, are amended to read as follows:

"(1) Candidates for appointment as dental surgeons must not be less than twenty-four nor more than forty years of age. They must be graduates of standard medical or dental colleges, trained in the several branches of dentistry, of good moral and professional character, and prior to appointment will be required to pass a satisfactory professional examination before a board of dental surgeons convened for that purpose by the Secretary of War.

* * * * *

"(5) Each dental surgeon will ordinarily be allowed one enlisted man as an assistant, who will be detailed from the acting hospital stewards or privates of the Hospital Corps, and whose duty it will be to assist the dentist in his operations, in caring for the instruments and other public property, in keeping the records, and in the performance of such other official work pertaining to this position as he may be directed by the proper authority to do. A member of the Hospital Corps detailed as dentist's assistant and stationed in a city or town will be allowed commutation of rations at the rate prescribed by the regulations, and will be provided with suitable room as quarters by the Quartermaster's Department; but when stationed at a post, in camp, or in the field he will be attached to the Hospital Corps or other organization for rations and quarters."

By command of Lieutenant-General Miles:

H. C. CORBIN,

Adjutant-General, Major-General, United States Army.

GENERAL ORDERS, }
No. 63.

HEADQUARTERS OF THE ARMY,
ADJUTANT-GENERAL'S OFFICE,
Washington, May 3, 1901.

* * * * *

II. By direction of the Secretary of War, the following is published to the Army for the information and guidance of all concerned:

The act of Congress approved February 2, 1901, authorizing the appointment of "contract surgeons," and that term being also employed in the act making appropriations for the support of the Army for the fiscal year ending June 30, 1902, the

term "acting assistant surgeon" as applied to physicians employed under contract with the Surgeon-General will be discontinued and the designation "contract surgeon, U. S. Army" will be used in all orders and official correspondence, and contract surgeons will use that term in affixing all official signatures.

By command of Lieutenant-General Miles:

H. C. CORBIN,
Adjutant-General, Major-General, United States Army.

GENERAL ORDERS, }
No. 67.

HEADQUARTERS OF THE ARMY,
ADJUTANT-GENERAL'S OFFICE,
Washington, May 13, 1901.

By direction of the Secretary of War, the following troops are relieved from duty in the Division of the Philippines and will proceed to San Francisco, Cal., where upon arrival they will be reported by telegraph to the Adjutant-General of the Army for assignment to stations:

Fourth United States Cavalry: Headquarters, field, staff, band, and three squadrons.

Coast Artillery: Twenty-ninth, Thirtieth, Thirty-second, and Thirty-third companies.

Field Artillery: First, Eighth, Tenth, Twelfth, and Thirteenth batteries.

Fourteenth United States Infantry: Headquarters, field, staff, band, and Second and Third battalions.

Eighteenth United States Infantry: Headquarters, field, staff, band, and Second and Third battalions.

Twenty-third United States Infantry: Headquarters, field, staff, band, and First and Second battalions.

Enlisted men of the organizations named serving in their first enlistments, and having one year or more to serve, will be transferred by the commanding general, Division of the Philippines, to other commands serving in that division, and enlisted men of other organizations than those herein named, serving in the Division of the Philippines, having three months or less to serve and having signified their intention not to reenlist, will be transferred to the returning organizations. The horses and horse equipments of the cavalry, and the horses, field guns, and equipment of the batteries above named will be retained in the Division of the Philippines.

The Quartermaster's Department will furnish the necessary transportation, the Subsistence Department suitable subsistence, and the Medical Department proper medical attendance and supplies.

By command of Lieutenant-General Miles:

H. C. CORBIN,
Adjutant-General, Major-General, United States Army.

GENERAL ORDERS, }
No. 66.

HEADQUARTERS OF THE ARMY,
ADJUTANT-GENERAL'S OFFICE,
Washington, May 13, 1901.

By direction of the Secretary of War, the following order from the War Department is published to the Army for the information and guidance of all concerned:

WAR DEPARTMENT, Washington, May 8, 1901.

By direction of the President, the organization of the enlisted strength of the Army under the act of Congress approved February 2, 1901, entitled "An act to increase the efficiency of the permanent military establishment of the United States," is established as follows:

CAVALRY.

12 troops of 85 enlisted men each.....	1,020
Regimental and squadron noncommissioned staff	8
Regimental band	28
Total number of enlisted men in regiment.....	1,056
Number of regiments	15
Total number of enlisted men in cavalry	15,840

Each troop of cavalry will consist of—

First sergeant	1	Saddler	1
Quartermaster-sergeant	1	Wagoner	1
Sergeants	6	Trumpeters	2
Corporals	8	Privates	61
Cooks	2		
Blacksmiths and farriers	2	Total	85

Each cavalry band will consist of—

Chief musician	1	Corporals	8
Chief trumpeter	1	Cook	1
Principal musician	1	Privates	11
Drum major	1		
Sergeants	4	Total	28

ARTILLERY CORPS.

Sergeants-major, senior grade	21
Sergeants-major, junior grade	27
10 bands (organized as provided for cavalry) of 28 men each	280

Total noncommissioned staff and bands

Coast artillery.

126 companies of 109 enlisted men each

Field artillery.

30 batteries of 160 enlisted men each

Total number of enlisted men in Artillery Corps

Each company of coast artillery will consist of—

First sergeant	1	Mechanics	2
Quartermaster-sergeant	1	Musicians	2
Sergeants	8	Privates	81
Corporals	12		
Cooks	2	Total	109

Each battery of field artillery will consist of—

First sergeant	1	Artificers	4
Quartermaster-sergeant	1	Musicians	2
Stable sergeant	1	Privates	151
Sergeants	6		
Corporals	12	Total	160
Cooks	2		

INFANTRY.

12 companies of 104 enlisted men each	1,248
Regimental and battalion noncommissioned staff	8
Regimental band	28

Total number of enlisted men in regiment

Number of regiments

Total number of enlisted men in infantry

Each infantry company will consist of—

First sergeant	1	Artificer	1
Quartermaster-sergeant	1	Musicians	2
Sergeants	6	Privates	81
Corporals	10		
Cooks	2	Total	104

Each infantry band will consist of—

Chief musician	1	Cook	1
Principal musician	1	Privates	12
Drum major	1		
Sergeants	4	Total	28
Corporals	8		

ENGINEERS.

4 companies of 104 enlisted men each	416
Battalion noncommissioned staff	2

Total number of enlisted men in battalion	418
Number of battalions	3

1,254

Engineer band (organized as provided for infantry)	28
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Total number of men enlisted in engineers	1,282
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Each engineer company will consist of—

First sergeant	1	Musicians	2
Quartermaster-sergeant	1	First-class privates	40
Sergeants	8	Second-class privates	40
Corporals	10		
Cooks	2	Total	104

Total enlisted in line of the Army	74,504
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STAFF DEPARTMENTS, ETC.

U. S. Military Academy	298
Signal Corps	760
Ordnance Department	700
Post commissary-sergeants	200
Post quartermaster-sergeants	150
Electrician sergeants	100
Indian scouts	75
Recruiting parties and recruits	500

Total staff, etc.	2,783
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Total Army	77,287
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As rapidly as the increase of the enlisted force of the artillery makes the appointment of officers under the act of February 2, 1901, possible, 14 additional batteries of field artillery and 32 additional companies of coast artillery will be organized, under the direction of the division and department commanders, in the manner prescribed by General Orders, No. 25, Adjutant-General's Office, February 28, 1901, by making transfers from existing batteries and companies, the noncommissioned officers and men to be divided, as far as practicable, in such a way as to give equal promotion to the noncommissioned officers and to give to each battery and company the same proportion of experienced artillerists, and both the old and new batteries and companies being raised to the strength above prescribed by the assignment of recruits or transfers from the cavalry or infantry.

Division and department commanders will report by telegraph the number of men having good records who desire to be transferred from the cavalry or infantry to the coast or field artillery serving in their respective departments.

Upon each addition of 1,802 enlisted men to the strength of the artillery arm, one-sixth of the number of additional officers authorized by the act of February 2, 1901, will be appointed by promotion or new appointment.

Troops, batteries, and companies, either old or new organizations, which are below the strength herein established, will be filled as soon as practicable, and such of the old organizations as have already been recruited beyond the maximum fixed will receive no further additions until reduced below it. This reduction will be effected by casualties as they occur or by transfers as may be hereafter directed, except that any excess of noncommissioned officers in any grade will be disposed of by transfer

or otherwise not later than July 1, 1901. Recruits assigned to troops and companies of the new regiments of cavalry and infantry now being organized under the act of February 2, 1901, in excess of the maximum strength herein fixed will be transferred to other troops and companies of their respective regiments which may be below the maximum strength.

All orders and instructions issued since February 2, 1901, relating to the enlisted strength of the Army which conflict with this order are hereby revoked.

ELIHU ROOT,
Secretary of War.

By command of Lieutenant-General Miles:

H. C. CORBIN,
Adjutant-General, Major-General, United States Army.

GENERAL ORDERS, }
No. 72.

HEADQUARTERS OF THE ARMY,
ADJUTANT-GENERAL'S OFFICE,
Washington, May 20, 1901.

By direction of the President, under the authority conferred by section 37 of the act of Congress approved February 2, 1901, the present Porto Rico Regiment of Infantry will be retained in service and reorganized as a provisional regiment of infantry of two battalions of four companies each.

The regiment will be designated the "Porto Rico Provisional Regiment of Infantry," and will be constituted as follows:

One lieutenant-colonel.
Two majors.
Eight captains.
One assistant surgeon with the rank of captain.
One assistant surgeon with the rank of first lieutenant.
Ten first lieutenants, two of whom shall be available for detail as battalion adjutants.
Eight second lieutenants.

Eight companies of 104 enlisted men each.....	832
Battalion sergeants-major	2
Color sergeants.....	2
Hospital stewards	2
Regimental band (organized as provided for infantry)	28

Total number of enlisted men in regiment 866

Each company will consist of—

First sergeant	1	Artificer	1
Quartermaster-sergeant	1	Musicians	2
Sergeants	6	Privates	81
Corporals	10		
Cooks	2	Total	104

The commissioned officers of the existing regiment will be honorably discharged or mustered out June 30, 1901, and the officers of the provisional regiment will be appointed July 1, 1901, for a period of three years unless sooner discharged. The officers selected for appointment or reappointment in the regiment will be notified in advance that they will be appointed July 1, and authorized to accept their appointments on that date. Those, if any, who may not desire to accept appointments or reappointments on July 1 will be requested to so advise the Adjutant-General through military channels as early as practicable in advance.

The enlisted strength of the regiment shall be composed of natives of the island of Porto Rico as far as practicable, and the pay, rations, and allowances of the enlisted men shall be the same as those authorized for the enlisted men of the Regular Army.

The enlisted men of the existing regiment who have become disqualified for service and those who are acceptable and desire to reenlist in the provisional regiment will be discharged "by authority of the Secretary of War, their services being no longer required," by the regimental commander, who will furnish discharge certificates and final statements.

Final muster-out rolls of the existing regiment and physical examinations of all men discharged therefrom will be furnished, and other requirements of General Orders, No. 17, February 15, 1901, from this office, will be strictly complied with. The date of final muster out is fixed as June 30, 1901.

The organization of the provisional regiment will be begun as soon as practicable by enlistments or reenlistments for periods of three years unless sooner discharged. The commanding officer, district of Porto Rico, is authorized to grant furloughs of not more than thirty days to soldiers who reenlist upon the day following discharge from their former regiment.

The Second Battalion, Companies E, F, G, and H, of the provisional regiment is designated for mounted service, commencing this date.

The records of the existing regiment and of the provisional regiment will be kept entirely distinct from each other.

By command of Lieutenant-General Miles:

H. C. CORBIN,
Adjutant-General, Major-General, United States Army.

GENERAL ORDERS, }
No. 73.

HEADQUARTERS OF THE ARMY,
ADJUTANT-GENERAL'S OFFICE,
Washington, May 21, 1901.

1. By direction of the Secretary of War, the enlisted men of the following companies of the new infantry regiments are transferred, as organizations, as follows:

Companies E, F, G, and H, Twenty-sixth United States Infantry, now at Fort McPherson, Ga., to the Twenty-seventh United States Infantry as Companies A, B, C, and D, respectively, with station at Fort McPherson.

Companies A, B, C, and D, Twenty-seventh United States Infantry, now in the division of the Philippines, to the Twenty-sixth United States Infantry as Companies I, K, L, and M, respectively, with station in the division of the Philippines.

Companies A, B, C, and D, Twenty-eighth United States Infantry, now in the division of the Philippines, to the Thirtieth United States Infantry as Companies E, F, G, and H, respectively, with station in the division of the Philippines.

Officers belonging to companies transferred will remain in their original regiments unless transferred in special orders from this office. Battalion noncommissioned staff are included in the foregoing transfers.

Each company will retain its books, records, and property, and the fact of transfer, change of designation, etc., will be duly entered on its records.

2. The organization and reorganization of the five new infantry regiments on the basis of the enlisted strength (104 men per company) established in General Orders, No. 66, May 13, 1901, from this office, will proceed as follows:

TWENTY-SIXTH UNITED STATES INFANTRY.

First Battalion.—Companies A, B, C, and D now in the division of the Philippines.

Second Battalion.—Companies E, F, G, and H to be organized in the division of the Philippines by transfers from the companies of the First and Third Battalions and by assignment of recruits.

Third Battalion.—Companies I, K, L, and M to be organized, respectively, from former Companies A, B, C, and D, Twenty-seventh United States Infantry, in the Division of the Philippines.

TWENTY-SEVENTH UNITED STATES INFANTRY.

First Battalion.—Companies A, B, C, and D to be reorganized at Fort McPherson, Ga., from former Companies E, F, G, and H, Twenty-sixth United States Infantry respectively.

Second Battalion.—Organization to be completed at regimental headquarters, Plattsburg Barracks, N. Y.

Third Battalion.—To be organized after Second Battalion is completed.

TWENTY-EIGHTH UNITED STATES INFANTRY.

First Battalion.—To be organized anew at regimental headquarters, Vancouver Barracks, Wash.

Second Battalion.—Organization to be completed.

Third Battalion.—To be organized after First Battalion is completed.

TWENTY-NINTH UNITED STATES INFANTRY.

Organization to be completed at regimental headquarters, Fort Sheridan, Ill.

THIRTIETH UNITED STATES INFANTRY.

First Battalion.—Companies A, B, C, and D now in the Division of the Philippines. *Second Battalion.*—Companies E, F, G, and H to be organized, respectively, from the former Companies A, B, C, and D, Twenty-eighth United States Infantry, in the Division of the Philippines.

Third Battalion.—To be organized in the Division of the Philippines by transfers from the companies of the First and Second Battalions and by assignment of recruits.

3. The headquarters, field, staff, and band, Twenty-sixth United States Infantry, together with all officers of the regiment on duty at Fort McPherson and necessary recruits for the Second Battalion of the regiment, will proceed to the Division of the Philippines, arriving in San Francisco in ample time to take passage on the army transport sailing about June 25, 1901.

4. The headquarters, field, staff, and band, Thirtieth United States Infantry, together with all officers of the regiment on duty at Fort Logan, Colo., and necessary recruits for the Third Battalion of the regiment will proceed to the Division of the Philippines, arriving in San Francisco in ample time to take passage on the army transport sailing about July 1, 1901.

Department commanders will by concert of action arrange details of movement and report hours of departure and arrival and strength of command by telegraph to the Adjutant-General of the Army.

Commanding officers will make every proper effort to induce enlisted men going abroad who have relatives dependent upon them for support to make allotments of pay as contemplated by General Orders, No. 149, August 17, 1899, from this office.

Property left behind will be securely packed, marked, and listed in duplicate.

The Quartermaster's Department will furnish the necessary transportation, the Subsistence Department suitable rations, and the Medical Department proper medical attendance and supplies.

By command of Lieutenant-General Miles:

H. C. CORBIN,

Adjutant-General, Major-General, United States Army.

GENERAL ORDERS, }

No. 74.

HEADQUARTERS OF THE ARMY,

ADJUTANT-GENERAL'S OFFICE,

Washington, May 21, 1901.

By direction of the Secretary of War, the Second Battalion United States Engineers will proceed from Fort Totten, N. Y., to San Francisco, Cal., for service in the Division of the Philippines, so as to arrive in ample time to depart on transport sailing for Manila about June 25, 1901.

The commanding general Department of California will assign all available engineer recruits at San Francisco to the battalion upon arrival there, in order that the same may be filled as far as practicable to the maximum.

The battalion commander will report hours of departure and arrival and strength of command by telegraph to the Adjutant-General of the Army, also departure and arrival to the commanding general Department of California, who will arrange the necessary details.

Property left behind will be securely packed, marked, and listed in duplicate.

The battalion commander will make every proper effort to induce enlisted men who have dependent relatives to make allotments of pay as contemplated by General Orders, No. 149, August 17, 1899, from this office.

The Quartermaster's Department will furnish the necessary transportation, the Subsistence Department suitable rations, and the Medical Department proper medical attendance and supplies.

By command of Lieutenant-General Miles:

H. C. CORBIN,

Adjutant-General, Major-General, United States Army

GENERAL ORDERS, }

No. 78.

HEADQUARTERS OF THE ARMY,

ADJUTANT-GENERAL'S OFFICE,

Washington, June 6, 1901.

The following orders of the Secretary of War are published for the information and guidance of all concerned:

1. Under the provisions of section 9 of the act of Congress approved February 2, 1901, five batteries of field artillery and three companies of coast artillery, in addition

to those now in service, will be organized with the commissioned officers and at the stations hereinafter designated:

Fort Sam Houston, Tex., one battery, the Seventeenth:

Captain, George G. Gatley.

First lieutenant, _____.

Second lieutenant, Edward H. De Armond.

The Presidio of San Francisco, Cal., one battery, the Eighteenth:

Captain, David J. Rumbough.

First lieutenant, Ralph P. Brower.

Second lieutenant, _____.

Fort Riley, Kans., two batteries:

The Nineteenth—

Captain, Peyton C. March.

First lieutenant, Andrew Moses.

Second lieutenant, Beverly F. Browne.

The Twentieth—

Captain, William J. Snow.

First lieutenant, Henry L. Newbold.

Second lieutenant, Francis W. Clark.

Fort Sheridan, Ill., one battery, the Twenty-first:

Captain, Lucien G. Berry.

First lieutenant, _____.

Second lieutenant, Jesse C. Nicholls.

Fort Hancock, N. J., one company, the Ninety-fifth:

Captain, Tiemann N. Horn.

First lieutenant, _____.

Second lieutenant, _____.

Fort Warren, Mass., one company, the Ninety-sixth:

Captain, Arthur W. Chase.

First lieutenant, _____.

Second lieutenant, _____.

Fort Adams, R. I., one company, the Ninety-seventh:

Captain, Frank G. Mauldin.

First lieutenant, _____.

Second lieutenant, _____.

The officers herein assigned to batteries and companies will proceed to join their proper stations. The travel enjoined is necessary for the public service.

2. The additional batteries and companies authorized in this order will be organized as directed in General Orders, No. 66, May 13, 1901, from this office, at the stations and by the transfers from existing organizations, as follows:

FIELD ARTILLERY.

Post.	From the—	To the—
Fort Sam Houston, Tex.	Second Battery.....	Seventeenth Battery.
Presidio of San Francisco, Cal.	Fifth Battery.....	Eighteenth Battery.
Fort Riley, Kans.	Sixth Battery.....	Nineteenth Battery.
Fort Riley, Kans.	Seventh Battery.....	Twentieth Battery.
Fort Sheridan, Ill.	Ninth Battery.....	Twenty-first Battery.

COAST ARTILLERY.

Fort Hancock, N. J.	Forty-eighth Company.....	Ninety-fifth Company.
Fort Warren, Mass.	Seventy-seventh Company.....	Ninety-sixth Company.
Fort Adams, R. I.	Seventy-eighth Company.....	Ninety-seventh Company.

The organization of the new batteries and companies will be commenced without delay by the transfers of enlisted men herein directed, and the recruitment to the authorized strength of the organizations will proceed as rapidly as recruits become available.

Post commanders will detail available officers to organize the new batteries and companies until the arrival of officers assigned to them.

Company funds, including stock in post exchanges, will be divided as directed in Circular No. 13, April 15, 1901, from this office.

3. Two additional artillery bands will be organized, composed as heretofore authorized by law for artillery regiments, and they will be known as the Ninth and Tenth bands, Artillery Corps. Fort Riley, Kans., and Fort Warren, Mass., are designated as the present stations for those bands, respectively, and the commanding officers of those posts are hereby charged with the duty of organizing the bands mentioned.

By command of Lieutenant-General Miles:

H. C. CORBIN,
Adjutant-General, Major-General, United States Army.

GENERAL ORDERS, }
No. 81.

HEADQUARTERS OF THE ARMY,
ADJUTANT-GENERAL'S OFFICE,
Washington, June 13, 1901.

By direction of the Secretary of War the following artillery districts are announced:

District commanders will visit the posts in their districts at least twice every month, inspect them prepared for action, and correct all defects.

Districts being purely tactical units, correspondence relating to fire control and artillery efficiency only will pass through district commanders; that relating to matters of administration will be conducted as heretofore.

ARTILLERY DISTRICTS.

District of Portland.

Fort Preble, Me.

Fort Williams, Me.

District of Boston.

Fort Warren, Mass.
Fort Strong, Mass.

Fort Banks, Mass.
Fort Constitution, N. H. (attached).

District of Narragansett.

Fort Adams, R. I.
Fort Wetherill, R. I.

Fort Greble, R. I.
Fort Rodman, Mass. (attached).

District of New London.

Fort H. G. Wright, N. Y.
Fort Michie, N. Y.
Fort Trumbull, Conn.

Fort Terry, N. Y.
Fort Mansfield, R. I.

Eastern district of New York.

Fort Schuyler, N. Y.
Fort Slocum, N. Y.

Fort Totten, N. Y.

Southern district of New York.

Fort Wadsworth, N. Y.
Fort Newton, N. Y.

Fort Hamilton, N. Y.
Fort Hancock, N. J.

District of the Delaware.

Fort Mott, N. J.
Fort Delaware, Del.

Fort Du Pont, Del.

District of the Chesapeake.

Fort Monroe, Va.

District of Baltimore.

Fort McHenry, Md.
Fort Howard, Md.
Fort Carroll, Md.

Fort Smallwood, Md.
Fort Armistead, Md.

District of the Potomac.

Fort Hunt, Va.

Fort Washington, Md.

District of Charleston.

Fort Sumter, S. C.
Fort Caswell, N. C. (attached).

Sullivan's Island, S. C.

District of Savannah.

Fort Screven, Ga.
Fort Fremont, S. C.

Camp Hilton Head, S. C.

District of Key West.

Fort Taylor, Fla.
Key West Barracks, Fla.

Fort Dade, Fla.
Fort De Soto, Fla.

District of Pensacola.

Fort Barrancas, Fla.
Fort McRee, Fla.

Fort Pickens, Fla.
Fort Morgan, Ala. (attached).

District of New Orleans.

Fort St. Philip, La.
Fort Jackson, La.

Jackson Barracks, La.

District of San Diego.

San Diego Barracks, Cal.

Fort Rosecrans, Cal.

District of San Francisco.

Presidio, Cal.
Fort Winfield Scott, Cal.
Fort Mason, Cal.
Fort Miley, Cal.

Alcatraz Island, Cal.
Fort McDowell, Cal.
Fort Baker, Cal.

District of Puget Sound.

Fort Casey, Wash.

Fort Flagler, Wash.

District of the Columbia.

Fort Stevens, Oreg.
Fort Columbia, Wash.

Fort Canby, Wash.

District of San Juan.

Fort El Morro, P. R.

Fort San Cristobal, P. R.

District of Honolulu.

Camp McKinley, Hawaiian Islands.

By command of Lieutenant-General Miles:

H. C. CORBIN,
Adjutant-General, Major-General, United States Army.

GENERAL ORDERS, }
No. 87. }

HEADQUARTERS OF THE ARMY,
ADJUTANT-GENERAL'S OFFICE,
Washington, June 22, 1901.

By direction of the Secretary of War the following order from the War Department is published to the Army for the information and guidance of all concerned:

WAR DEPARTMENT, Washington, June 21, 1901.

On and after the 4th day of July, 1901, until it shall be otherwise ordered, the president of the Philippine Commission will exercise the executive authority in all civil affairs in the government of the Philippine Islands heretofore exercised in such affairs by the military governor of the Philippines, and to that end the Hon. William H. Taft, president of the said commission, is hereby appointed civil governor of the Philippine Islands. Such executive authority will be exercised under and in conformity to the instructions to the Philippine commissioners dated April 7, 1900, and subject to

the approval and control of the Secretary of War of the United States. The municipal and provincial civil governments which have been or shall hereafter be established in said islands, and all persons performing duties appertaining to the offices of civil government in said islands will in respect of such duties report to the said civil governor.

The power to appoint civil officers, heretofore vested in the Philippine Commission or in the military governor, will be exercised by the civil governor, with the advice and consent of the commission.

The military governor of the Philippines is hereby relieved from the performance, on and after the said 4th day of July, of the civil duties hereinbefore described, but his authority will continue to be exercised as heretofore in those districts in which insurrection against the authority of the United States continues to exist, or in which public order is not sufficiently restored to enable provincial civil governments to be established under the instructions to the commission dated April 7, 1900.

By the President:

ELIHU ROOT,
Secretary of War.

By command of Lieutenant-General Miles:

THOMAS WARD,
Acting Adjutant-General.

GENERAL ORDERS, }
No. 101.

HEADQUARTERS OF THE ARMY,
ADJUTANT-GENERAL'S OFFICE,
Washington, August 2, 1901.

The following orders of the Secretary of War are published for the information and guidance of all concerned:

1. Under the provisions of section 9 of the act of Congress approved February 2, 1901, nine companies of coast artillery, in addition to those now in service, will be organized with the commissioned officers and at the stations hereinafter designated:

Fort Hamilton, N. Y., one company, the Ninety-eighth:

Captain, Hamilton Rowan.

First lieutenant, _____.

Second lieutenant, _____.

Fort Morgan, Ala., one company, the Ninety-ninth:

Captain, William P. Pence.

First lieutenant, _____.

Second lieutenant, _____.

Fort Terry, N. Y., one company, the One hundredth:

Captain, Dwight E. Aultman.

First lieutenant, _____.

Second lieutenant, _____.

Fort Totten, N. Y., one company, the One hundred and first:

Captain, John C. Gilmore, jr.

First lieutenant, _____.

Second lieutenant, _____.

Fort Caswell, N. C., one company, the One hundred and second:

Captain, Rogers F. Gardner.

First lieutenant, _____.

Second lieutenant, _____.

Fort Howard, Md., one company, the One hundred and third:

Captain, Harry E. Smith.

First lieutenant, _____.

Second lieutenant, _____.

Fort Washington, Md., one company, the One hundred and fourth:

Captain, George H. McManus.

First lieutenant, _____.

Second lieutenant, _____.

The Presidio of San Francisco, Cal., one company, the One hundred and fifth—

Captain, Louis R. Burgess.

First lieutenant, _____.

Second lieutenant, _____.

Fort Lawton, Wash., one company, the One hundred and sixth—

Captain, Charles P. Summerall.

First lieutenant, _____.

Second lieutenant, _____.

The officers herein assigned to companies will proceed to join their proper stations. The travel enjoined is necessary for the public service.

2. The additional companies authorized in this order will be organized as directed in General Orders, No. 66, May 13, 1901, from this office, at the stations and by the transfers from existing organizations, as follows:

Post.	From the—	To the—
Fort Hamilton, N. Y	Fifty-first Company	Ninety-eighth Company.
Fort Morgan, Ala	Eighth Company	Ninety-ninth Company.
Fort Terry, N. Y	Forty-third Company	One hundredth Company.
Fort Totten, N. Y	Eighty-second Company	One hundred and first Company.
Fort Caswell, N. C	Thirty-eighth Company	One hundred and second Company.
Fort Howard, Md	Fortieth Company	One hundred and third Company.
Fort Washington, Md	Thirty-seventh Company	One hundred and fourth Company.
Presidio of San Francisco, Cal	Twenty-ninth Company	One hundred and fifth Company.
Fort Lawton, Wash	Thirty-second Company	One hundred and sixth Company.

The organization of the new companies will be commenced without delay by the transfers of enlisted men herein directed. The recruitment to the authorized strength of all the companies named will proceed as rapidly as recruits become available.

Post commanders will detail available officers to organize the new companies until the arrival of officers assigned to them.

Company funds, including stock in post exchanges, will be divided as directed in Circular No. 13, April 15, 1901, from this office.

By command of Lieutenant-General Miles:

THOMAS WARD,
Acting Adjutant-General.

GENERAL ORDERS, }
No. 108.

HEADQUARTERS OF THE ARMY,
ADJUTANT-GENERAL'S OFFICE,
Washington, August 14, 1901.

The following orders of the Acting Secretary of War are published for the information and guidance of all concerned:

Under the provisions of section 9 of the act of Congress approved February 2, 1901, ten companies of coast artillery, in addition to those now in service, will be organized as directed in General Orders, No. 66, May 13, 1901, from this office, at the stations named and by the transfers from existing organizations, as follows:

At—	From the—	To the—
Fort Preble, Me	Seventy-fifth Company	One hundred and seventh Company.
Fort Williams, Me	Seventy-fourth Company	One hundred and eighth Company.
Fort Greble, R. I	Seventy-second Company	One hundred and ninth Company.
Fort Adams, R. I	Seventy-ninth Company	One hundred and tenth Company.
Fort Dade, Fla	First Company	One hundred and eleventh Company.
Fort Du Pont, Del	Forty-fifth Company	One hundred and twelfth Company.
Fort McHenry, Md	Forty-seventh Company	One hundred and thirteenth Company.
Fort Slocum, N. Y	Eightieth Company	One hundred and fourteenth Company.
Presidio of San Francisco, Cal	Thirtieth Company	One hundred and fifteenth Company.
Fort Screven, Ga	Fifth Company	One hundred and sixteenth Company.

The organization of the new companies will be commenced without delay by the transfers of enlisted men herein directed. The recruitment to the authorized strength of all companies named will proceed as rapidly as recruits become available.

Post commanders will detail available officers to organize the new companies until the arrival of officers assigned to them.

Company funds, including stock in post exchanges, will be divided as directed in Circular No. 13, April 15, 1901, from this office.

By command of Lieutenant-General Miles:

THOMAS WARD,
Acting Adjutant-General.

GENERAL ORDERS, }

No. 116. }

HEADQUARTERS OF THE ARMY,
ADJUTANT-GENERAL'S OFFICE,
Washington, September 3, 1901.

The following orders of the Secretary of War are published for the information and guidance of all concerned:

1. Under the provisions of section 9 of the act of Congress approved February 2, 1901, nine batteries of field artillery, in addition to those now in service, will be organized with the commissioned officers and at the stations hereinafter designated.

Fort Douglas, Utah, one battery, the Twenty-second—

Captain, Adelbert Cronkhite.

First lieutenant, _____.

Second lieutenant, _____.

Fort Ethan Allen, Vt., one battery, the Twenty-third—

Captain, John Conklin, jr.

First lieutenant, _____.

Second lieutenant, _____.

Habana, Cuba, one battery, the Twenty-ninth—

Captain, Edward E. Gayle.

First lieutenant, _____.

Second lieutenant, _____.

The Presidio of San Francisco, Cal., one battery, the Twenty-fourth—

Captain, John V. White.

First lieutenant, _____.

Second lieutenant, _____.

Manila, P. I., one battery, the Twenty-fifth—

Captain, Charles G. Woodward.

First lieutenant, _____.

Second lieutenant, _____.

Vancouver Barracks, Wash., one battery, the Twenty-sixth—

Captain, Harry L. Hawthorne.

First lieutenant, _____.

Second lieutenant, _____.

Fort Ethan Allen, Vt., one battery, the Twenty-seventh—

Captain, John E. McMahon.

First lieutenant, _____.

Second lieutenant, _____.

Fort Leavenworth, Kans., one battery, the Twenty-eighth—

Captain, Charles T. Menoher.

First lieutenant, _____.

Second lieutenant, _____.

Fort Walla Walla, Wash., one battery, the Thirtieth—

Captain, Edward F. McGlachlin, jr.

First lieutenant, _____.

Second lieutenant, _____.

The officers herein assigned to batteries will proceed to join their proper stations. The travel enjoined is necessary for the public service.

2. The additional batteries authorized in this order will be organized as directed in General Orders, No. 66, May 13, 1901, from this office, by transfers from existing organizations and at the stations named, as follows:

From old battery.		To new battery.	
No.	Stationed at—	No.	To be organized at—
12	Fort Douglas, Utah.....	22	Fort Douglas, Utah.
11	Fort Hamilton, N. Y.	23	Fort Ethan Allen, Vt.
1	Presidio of San Francisco, Cal.....	24	Presidio of San Francisco, Cal.
14	Manila, Philippine Islands.....	25	Manila, P. I.
8	Vancouver Barracks, Wash.....	26	Vancouver Barracks, Wash.
4	Fort Myer, Va.....	27	Fort Ethan Allen, Vt.
16	Fort Leavenworth, Kans.....	28	Fort Leavenworth, Kans.
3	Havana, Cuba.....	29	Havana, Cuba.
10	Fort Walla Walla, Wash.....	30	Fort Walla Walla, Wash.

The organization of the new batteries will be commenced without delay by the transfer of enlisted men herein directed, and the recruitment to the authorized strength of the organizations will proceed as rapidly as recruits become available.

The Fourteenth and Twenty-fifth Field Batteries will be organized and equipped as mountain batteries of 6 guns and 120 enlisted men (91 privates) each, the enlisted strength to be completed by voluntary transfers from troops serving in the Division of the Philippines.

Where the transfer involves change of station the men transferred will be attached to their former battery until the latter is recruited approximately to the maximum, when the detachment will be sent to the station of the new battery.

Post commanders will detail available officers to organize the new batteries until the arrival of the officers assigned to them.

Company funds, including stock in post exchanges, will be divided as directed in Circular No. 13, April 15, 1901, from this office.

At the stations of the new batteries where barracks and quarters are not provided the artillery organizations will go into camp until the Quartermaster's Department can furnish adequate permanent barracks and quarters.

By command of Lieutenant-General Miles:

THOMAS WARD,
Acting Adjutant-General.

GENERAL ORDERS, }
No. 126.

HEADQUARTERS OF THE ARMY,
ADJUTANT-GENERAL'S OFFICE,
Washington, September 21, 1901.

By direction of the Secretary of War, the following distribution of the 126 companies of coast artillery authorized by the act of February 2, 1901, is announced, in order that the various staff departments may make necessary provision at the posts named for their permanent occupancy by the garrisons designated, and for the information of all concerned:

Fort Williams, Me.....	2	Fort Washington, Md.....	3
Fort Levett (and Scammel), Me	1	Fort Hunt, Va	1
Fort Preble, Me	2	Fort Monroe, Va	8
Great Diamond Island, Me.....	4	Fort Caswell, N. C.....	2
Fort Foster, N. H	2	Sullivans Island, S. C.....	3
Fort Revere, Mass.....	1	Fort Fremont, S. C	1
Fort Warren, Mass	2	Fort Screven, Ga	3
Fort Standish, Mass	1	Fort Taylor, Fla.....	3
Fort Strong, Mass	1	Fort Dade, Fla	1
Fort Banks, Mass	2	Fort De Soto, Fla.....	1
Fort Heath, Mass	1	Fort Pickens, Fla.....	3
Fort Andrews, Mass.....	1	Fort McRee, Fla.....	1
Fort Rodman, Mass	1	Fort Morgan, Ala.....	2
Fort Adams, R. I.....	2	Jackson Barracks, La	2
Fort Greble, R. I.....	2	Galveston, Tex	2
Fort Wetherill, R. I.....	2	Fort Rosecrans, Cal.....	2
Fort H. G. Wright, N. Y	2	Fort Miley, Cal.....	2
Fort Terry, N. Y.....	2	Presidio of San Francisco, Cal	5
Fort Michie, N. Y	1	Fort Baker, Cal	3
Fort Schuyler, N. Y	2	Fort Columbia, Wash.....	1
Fort Totten, N. Y	4	Fort Stevens, Oreg.....	2
Fort Slocum, N. Y.....	1	Fort Casey, Wash	3
Fort Wadsworth, N. Y	4	Fort Flagler, Wash	3
Fort Hamilton, N. Y	4	Fort Worden, Wash	2
Fort Hancock, N. J.....	4	San Juan, P. R.....	2
Fort Mott, N. J	2	Honolulu, H. I.....	2
Fort Du Pont, Del.....	2	Philippine Islands.....	4
Fort Armistead, Md	1		
Fort Carroll, Md	1		
Fort Howard, Md	2		
		Total	126

Until such time as accommodations can be provided at the stations named the following distribution of coast artillery companies will prevail:

Fort Williams.....	2	Fort Trumbull.....	2
Fort Preble.....	2	Fort H. G. Wright.....	2
Fort Revere.....	1	Fort Mansfield.....	2
Fort Standish.....	1	Fort Terry.....	2
Fort Andrews.....	1	Fort Michie.....	2
Fort Warren.....	2	Fort Schuyler.....	1
Fort Strong.....	2	Fort Totten.....	5
Fort Banks.....	2	Fort Slocum.....	3
Fort Adams.....	4	Fort Columbus.....	3
Fort Greble.....	2	Fort Wadsworth.....	5
Fort Wetherill.....	2	Fort Hamilton.....	4
Fort Rodman.....	2	Fort Hancock.....	3
Fort Mott.....	2	Fort Morgan.....	2
Fort Delaware.....	2	Jackson Barracks.....	2
Fort Du Pont.....	2	Fort St. Philip.....	2
Fort Howard.....	2	Fort Jackson.....	2
Fort McHenry.....	3	Fort Rosecrans.....	2
Fort Washington.....	3	Presidio.....	5
Fort Hunt.....	1	Fort Winfield Scott.....	5
Fort Monroe.....	2	Fort Canby.....	1
Fort Caswell.....	2	Fort Stevens.....	2
Sullivan's Island.....	3	Fort Flagler.....	2
Fort Screven.....	3	Fort Lawton.....	2
Key West Barracks.....	3	San Juan.....	2
Fort Fremont.....	1	Honolulu.....	2
Fort De Soto.....	2	Philippine Islands.....	13
Fort Dade.....	2	Cuba.....	8
Fort Pickens.....	3		
Fort Barrancas.....	3	Total.....	126
Fort McRee.....	3		

By command of Lieutenant-Ge

THOMAS WARD,
Acting Adjutant-General.

CIRCULAR, }
No. 3. }

HEADQUARTERS OF THE ARMY,
ADJUTANT-GENERAL'S OFFICE,
Washington, January 31, 1901.

By direction of the Secretary of War, the following is published for the information and guidance of all concerned:

The register of passengers on the army transports shall show in case of every name thereon the address (giving street and number) of the relative whom it is desired shall be informed in the event of death.

In each case of death occurring on the transport among the registered passengers, i. e., officers and enlisted men not belonging to distinct commands on board, as well as civilians and employees, the transport quartermaster will secure the effects and prepare a letter to the nearest relative setting forth the name, rank, company, regiment, employment or condition of the deceased, place, cause, day, and hour of death, disposition made of remains and effects and list of the latter, and mail the communication at the earliest opportunity to its address. Such notification of death in the case of an officer, enlisted man, or civilian employee of the Army shall include also the information that if it be desired the remains will be shipped home at Government expense upon application therefor by the nearest relative addressed to the Quartermaster-General, U. S. Army, Washington, D. C.; but if not applied for within six weeks after arrival at port in the United States the remains will be buried in a national cemetery and thereafter will not be disinterred and shipped home at public expense; also that inquiries concerning the pay and effects of deceased officers and soldiers should be addressed to the Adjutant-General, U. S. Army, Washington, D. C.

By command of Lieutenant-General Miles:

H. C. CORBIN,
Adjutant-General.

CIRCULAR, }
No. 12. }

HEADQUARTERS OF THE ARMY,
ADJUTANT-GENERAL'S OFFICE,
Washington, April 8, 1901.

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II. The following decision has been made and is published to the Army for the information and guidance of all concerned:

Leaves of absence to army nurses.—Leave of absence with pay may be granted for not exceeding thirty days within any calendar year at any time after appointment to the superintendent of the Army Nurse Corps, a chief nurse, or a nurse, and at the rate of two and one-half days for each calendar month of active duty and not exceeding thirty days during any calendar year to a reserve nurse.—[Decision Sec. War, April 8, 1901—371428 A. G. O.]

By command of Lieutenant-General Miles:

H. C. CORBIN,
Adjutant-General, Major-General, United States Army.

**REPORT OF THE INSPECTOR-GENERAL TO
THE SECRETARY OF WAR.**

REPORT

OF THE

INSPECTOR-GENERAL OF THE ARMY.

WAR DEPARTMENT, INSPECTOR-GENERAL'S OFFICE,
Washington, D. C., September 28, 1901.

SIR: I have the honor to submit the following report of the operations of this Department during the past year, in addition to the matters relating to discipline, etc., which have been submitted to the Lieutenant-General Commanding the Army, under General Orders, No. 28, Headquarters of the Army, 1876.

Pursuant to provisions of the law of February 2, 1901, the officers of the Inspector-General's Department are 1 brigadier-general, 4 colonels, 4 lieutenant-colonels, and 8 majors. The latter are detailed from the line of the Army for a tour of duty of four years, and the first detail was 2 from the cavalry, 2 from the artillery, and 4 from the infantry. As there are at present 14 departments and headquarters, some of which necessitate the assignment of 2 officers and each of which should have at least 1, it can be readily seen that the provisions are hardly large enough to meet the requirements and emergencies, and must be greatly augmented by the appointments of special and acting inspectors-general from time to time.

Since the rendition of the last report the following changes have occurred in the personnel of the permanent officers: Col. R. P. Hughes, inspector-general, U. S. A., who has been on detached service as a brigadier-general of volunteers and in command of the Department of the Visayas, in the Philippines, was, on February 5, 1901, appointed a brigadier-general of the line, and Capt. John L. Chamberlain, of the First Artillery, was appointed a major, inspector-general, November 10, 1900.

Incident to the muster out of the volunteers and the transporting of the regulars to replace them, the Inspector-General's Department has had an exceedingly busy year, and it may not be amiss to state that during the year there were 10,333 inspections of different kinds made, or over 28 per day for every day of the year, including Sundays.

These figures are nearly twice as large as those of last year, and a

comparative statement of the work accomplished in the year before the Spanish war and three following years, may prove of interest:

Year.	Number of inspections.	Disbursements.											
		Amount inspected.	Total.	Post-office, ungarmented posts, soldiers' homes, branches, etc.	Colleges.	Recruiting rendezvous and stations.	Special investigations and reports.	Inspections of property.	National cemeteries.	Transports.	Total.	Students inspected.	Persons inspected, exclusive of students.
1897....	793	\$77,201,894.92	80	69	103	29	13	1,336	32	.....	2,475	12,645	42,748
1899....	686	342,265,201.83	91	148	2	21	31	5,424	34	.....	4,437	.....	.....
1900....	1,191	353,338,104.09	159	70	91	35	75	3,521	33	73	5,771	7,311	138,965
1901....	2,433	378,774,241.76	864	229	82	68	194	6,168	17	248	10,385	7,448	73,987

These inspections have been both arduous and exacting, and were performed by the officers of this corps and those temporarily connected therewith with a dispatch and care that reflect great credit upon all concerned.

It will be observed that in 1897 the total inspections made numbered but 2,475, while in the year just completed there were over four times as many, yet the permanent clerical force of this office has not been increased by a single clerk, and the large increase in the clerical work which has naturally grown from the augmentation of the Army from 25,000 to approximately 80,000 men has not been followed by a correspondingly adequate increase in the clerical force of the Inspector-General's Office.

During the year the operations in China have come to a satisfactory termination, and the troops composing the expedition have all been withdrawn with the exception of a small legation guard. All who participated deserve great credit for the signal manner in which the dangers and hardships encountered were surmounted and for the efficient and gallant style in which the expedition was carried to so successful an issue.

The conditions in the Philippine Islands appear well in hand, and the pacification of those islands seems to be making good headway. The reports received from Cuba and Porto Rico indicate a stable and settled condition in those islands. The matter of a suitable depository in the Philippines for the deposit of the funds placed to the credit of the disbursing officers serving therein should be given consideration, and attention is respectfully invited to the remarks of Major Lovering on this subject under the head of disbursements in this report.

A proviso which appears in the sundry civil bill, approved March 3, 1901, provides that the accounts of the National Home for Disabled Volunteer Soldiers, heretofore examined and supervised by this office, are to be sent direct to the accounting officers of the Treasury after an audit by the Board of Managers of the said Home, and the last accounts supervised by this office were for the quarter ending December 31, 1900. The benefits accruing from this supervision are fully set forth in the article on the National Home for Disabled Volunteer Soldiers in this report.

CLERKS FOR OUTSIDE INSPECTORS-GENERAL.

I again renew my recommendation of last year as to the extreme importance of having the clerical personnel of the Inspector-General's Department on a separate basis from those of other departments, and respectfully suggest that Congress be urged to insert in the next appropriation bill for the support of the Army the following, viz:

For pay of twenty-five clerks for inspectors-general, thirty-five thousand dollars: *Provided*, That hereafter the pay of clerks for inspectors-general who have served as such over fifteen years shall be one thousand eight hundred dollars per annum; the pay of clerks for inspectors-general who have served as such over ten years shall be one thousand six hundred dollars each per annum; the pay of clerks for inspectors-general who have served as such over five years shall be one thousand five hundred dollars each per annum; the pay of other clerks for inspectors-general shall be one thousand four hundred dollars each per annum.

For pay of fourteen messengers for inspectors-general, eleven thousand seven hundred and sixty dollars.

For traveling expenses of clerks for inspectors-general and expert accountant of the Inspector-General's Department, two thousand five hundred dollars.

This proposed legislation follows the same lines and in purport is the same as appears in the last Army bill for the clerks of the Pay Department at large, and surely the clerks of this department, who are often designated to assist in the inspection and supervision of the accounts and disbursements of the paymasters and the work of the clerks of that department, are entitled to, and should receive an equal, if not a greater, remuneration for their work.

The clerks of this department are, as a rule, gentlemen of long experience and of great efficiency and occupy positions of trust and responsibility, and I earnestly recommend that the above-suggested proviso be adopted.

On this subject Lieutenant-Colonel Reade, in his annual report, says:

Experience has demonstrated that, at least in this department, the clerical assistance furnished the Inspector-General at military posts during his annual tour of inspection, as contemplated by Army Regulations, is wholly unreliable and usually of the kind which, instead of "assisting" the inspector creates additional work for the clerk in his office, who has to waste valuable time in the correction of errors and mistakes made by the former. It is not claimed, however, that this lack of accuracy in their work is due to negligence or unwillingness to properly perform their duties; it is simply a matter of inexperience.

To enable the inspector to cover as much ground as practicable during the comparatively short time he is at each post, to make his reports as comprehensive and complete as possible, and to forward them with the least practicable delay, his authorized clerk should accompany him upon his inspection trips. It appears that this has been done in some departments, but an application made by me to the War Department for the necessary authority was not approved.

It is recommended that orders be issued authorizing inspectors-general of departments to have their clerks accompany them upon tours of inspection of posts, especially upon tours covering more than one post.

In recording the fact that the clerical work of this office has been faithfully and efficiently performed by the clerk assigned to it, it is but justice to invite attention to the present status of this particular class of civilian employees, i. e., the clerks assigned to the offices of inspectors-general at department headquarters. There appear to be [no] provisions of law for their promotion. Length of service in an office necessarily adds to the experience and efficiency of a clerk and increases his value to the Government. Why should not the latter recognize such increased value by increased remuneration? This is done in other branches of the Government service, and it would seem but fair that some law be enacted making proper provisions for the promotion of, or an increase of pay for length of service for, this class of clerks. The recommendation of the Inspector-General of the Army, contained in his last annual report, that clerks assigned by the Secretary of War to inspectors-general receive the same pay and travel allowance as paymaster's clerks, is heartily concurred in.

Maj. R. A. Brown, inspector-general volunteers, Department Southern Luzon, says:

In the performance of this work inspectors have labored under innumerable difficulties. The lack of proper clerical assistance has been pronounced, and the acting inspectors-general have done all work of this character themselves.

DISBURSEMENTS.

During the fiscal year ending June 30, 1901, there were 2,197 reports of inspections of the money accounts of disbursing officers of the Army, including insular accounts, received at this office; but owing to the urgent necessity of completing and submitting the annual report by September 30, only 1,740 of these reports could be tabulated and the results presented herein. During the preceding fiscal year the total number of these inspections was 1,406, so the increase for 1901 was 1,011—largely more than were made altogether for each of several years prior to 1899.

There has been this year, as always heretofore, more or less remissness in the rendition of the closing accounts required by A. R. 978. Referring to this matter, Lieutenant-Colonel Reade says:

Paragraph 877, Army Regulations of 1895 (Army Regulations, 978, of 1901), requiring the rendition of a closing account by an officer relieved from duty as disbursing officer is, in many cases, not complied with by the officer concerned; and frequently the latter has left the post and perhaps the department before this office has any knowledge of the fact that he has been relieved and the necessary action can be had calling for the report.

It is suggested that, in order to insure compliance with the regulations on this subject, the latter be amended so as to require these reports to be forwarded "through the post commander," and holding that officer partly responsible for the prompt rendition of the required statement, thus vesting in him the authority to call for same before the officer relieved leaves the post, if the statement has not been submitted already.

For 1901 the number of the reports of inspections (so far as tabulated) pertaining strictly to army funds was 1,329, the amount involved, including transfers, being \$229,726,009.65, as against \$287,700,522.05 for 1900—a decrease of \$57,974,512.40. It must be borne in mind, however, that 457 accounts pertaining to the fiscal year 1901 could not be considered, and that really there was no decrease at all for the year, but probably an increase, for, as a matter of fact, the total amount involved (including insular funds) for 1901 was \$367,824,834.02, as against a similar total of \$329,492,689.68 for 1900—an actual increase altogether of \$38,332,144.34.

The results for the fiscal year 1901, so far as tabulated, may be summarized as follows:

Balances taken up.....		\$19, 836, 597. 72
Receipts from Treasury.....	\$125, 864, 618. 22	
Receipts from sales.....	3, 865, 741. 32	
Receipts from other sources.....	5, 776, 966. 28	
		<hr/>
Transfers from officers.....		135, 507, 325. 80
		74, 382, 086. 13
		<hr/>
Total to be accounted for.....		229, 726, 009. 65
Disbursements.....	111, 920, 500. 40	
Deposited to credit United States Treasury.....	9, 981, 477. 05	
Transfers to other officers.....	84, 809, 532. 57	
		<hr/>
		206, 711, 600. 02
		<hr/>
Balance.....		23, 014, 409. 63

Balance distributed as follows:

United States Treasury	\$14,925,645.67
United States depositories, etc.....	2,085,028.06
Cash on hand.....	6,003,737.90

In the Philippines, and also while the troops were in China, disbursing officers have suffered no little inconvenience, and were obliged to take considerable risk with the funds intrusted to them, which were often of very large amount; or else, contrary to law, to deposit the funds in financial institutions which had not been and could not be designated as United States depositories. In China there was an absolute necessity for Mexican silver dollars for payment of expenses incurred in that country; and one disbursing officer had more than three tons of this money sent to him at one time. The inconvenience of carrying this money about in the field and the responsibility of protecting and caring for it may be readily imagined. On this subject, Major Lovering says:

U. S. depository for
Manila, P. I.

In Manila there are three banks—the Hong Kong and Shanghai Banking Corporation, the Chartered Bank of India, Australia and China, and the Banco Espanol Filipino, which under its charter claims the exclusive right of issuing money in the Philippines. Such money is now circulated here.

These banks generally make a charge for cashing Government checks and also for issuing exchange on the United States for money. For this reason Government checks are at a discount in Manila and the provinces.

The chief ordnance officer experiences difficulty in obtaining cash for his checks. He can not pay by check, as most of his employees are natives, generally ignorant, and incapable of obtaining cash for checks unless at an exorbitant rate of exchange. Nearly all of the employees are paid in cash, so that they may not be losers of a percentage of their pay.

The chief ordnance officer sometimes secures his cash from other departments—in one case from the commissary.

All disbursing officers carry large amounts of cash in order to make payments. The amounts in the case of the chief paymaster and chief quartermaster are over \$1,000,000. All disbursing officers have to pay in cash all vouchers except the vouchers of a few firms doing business in the United States, who are very desirous of obtaining exchange.

It is most earnestly recommended that a Government depository be established here, in order that disbursing officers may be able to keep their money therein, and that United States Government checks may be negotiable at par. This would tend to establish United States money in the Philippines.

The amount of cash on hand reported this year, \$6,003,737.90, is unusually large, and last year it amounted to only \$1,763,001.83, making an increase of \$4,240,736.07. This is in a measure explained by the above extract.

The sum of \$2,177.89 cash on hand was held this year by various treasurers of the Branches of the National Home for Disabled Volunteer Soldiers, leaving the net amount of \$6,001,560.01 in the hands of disbursing officers of the Army. The amount for 1901 is about 0.057 per cent of the entire year's disbursements by these disbursing officers, as against 0.012 in 1900; and it is 145 per cent of the monthly disbursements, against 161 in 1900. The extreme and average in the hands of army disbursing officers who held cash on hand were, respectively, \$1,648,214.30 and \$7,077.31. The similar figures for 1900 were \$1,013,129.66 and \$5,460.83; and for 1897 they were, respectively, \$3,830.37 and \$35.22. The extreme and average of those who had funds in United States depositories were, respectively, \$1,463,641.77 and \$2,458.75.

It has been shown that there is a decrease of \$57,974,512.40 in the total amount involved in this year's inspections of money accounts (so far as they could be considered), as compared with the similar transac-

tions in the preceding year. The following tabulation shows where the decrease occurred:

Decreased amounts:

Adjutant-General's Department	\$2,540.91
Subsistence Department	4,844,528.95
Engineer Department	6,050,947.45
Ordnance Department	2,643,684.98
Pay Department	44,875,667.72
Medical Department	832,486.75
Recruiting officers	90,129.12
National Homes for Disabled Volunteer Soldiers	597,672.45
Transport service	14,110,237.16

Total decrease

73,897,925.49

Increased amounts:

Quartermaster's Department	\$3,977,642.77
Miscellaneous	11,945,770.32
	15,923,413.09

Net decrease

57,974,512.40

The army disbursements from the Treasury for the last four fiscal years may be designated in groups, as follows.

	1898.	1899.	1900.	1901.
Army	\$22,283,505.40	\$151,672,186.79	\$117,933,539.75	\$84,940,908.93
River and harbor	15,479,985.46	25,842,296.93	24,769,168.63	19,490,546.94
Other civil	6,764,163.56	6,982,941.15	7,610,228.13	7,499,074.58
Total	44,527,654.42	184,497,394.87	150,372,936.51	111,930,530.45

During the past eight fiscal years the relation between the total amount involved and the disbursements, transfers, deposits in the Treasury, and balances on hand appear as follows:

Designation.	1894.	1895.	1896.	1897.	1898.	1899.	1900.	1901.
Disbursements	0.760	0.756	0.710	0.706	0.712	0.527	0.523	0.498
Transfers between officers .....	.163	.158	.207	.197	.184	.372	.355	.379
Redeposited in Treasury .....	.015	.018	.013	.018	.017	.031	.048	.034
Balances on hand .....	.062	.062	.070	.079	.087	.070	.074	.101

The average monthly disbursements of officers of the Army whose accounts were inspected during the year (so far as tabulated) was \$8,702,626.22, and their final balances represented 264 per cent of this average, as against 161 in 1900; 158 in 1899; 173 in 1898; 118 in 1897; 125 in 1896; 107 in 1895, and 88 in 1894. The percentage would probably have been much less in 1901 if the entire year's work could have been considered.

The subjoined tabulation shows the variation in these percentages in the principal disbursing departments during ten fiscal years, to wit:

Department.	1892.	1893.	1894.	1895.	1896.	1897.	1898.	1899.	1900.	1901.
Engineer	104	82	75	83	116	133	160	148	158	174
Ordnance	124	105	115	139	113	130	86	123	174	234
Quartermaster	53	120	135	179	170	161	256	186	245	361
Subsistence	99	39	73	119	89	109	133	146	68	131
Medical	102	186	83	131	205	71	313	126	171	261
Pay	48	90	66	83	77	101	108	142	142	231
Total	99	94	88	107	125	118	173	158	161	264

The total number of inspections made during the fiscal year, so far as considered in this report, including statements made under A. R. 978, and not including inspections of insular accounts, was 1,329.

The following tabulation shows the number of these inspections for four fiscal years—the law requiring such inspections to be made frequently, to wit:

Accounts.	1896.		1899.		1900.		1901.	
	Officers.	Inspections.	Officers.	Inspections.	Officers.	Inspections.	Officers.	Inspections.
General staff officers	206	362	324	497	301	666	283	458
Post staff officers	186	306	217	391	316	554	431	720
Other line officers	28	35	36	46	109	175	109	186
Soldiers' Home	11	11	10	12	11	11	13	15
Total	430	713	587	946	737	1,406	836	1,329
Average, each staff officer		1.7		1.5		2.2		1.6
Average, each post officer		1.6		1.8		1.7		1.7

Of the 1,329 inspections, involving \$229,726,009.65, it appears that 1,072 inspections (including 514 inspections of post officers), involving \$214,952,219.19, were made by officers of this department, and 2 inspections, involving \$370,106.23, were made by other officers, viz:

Department.	Inspected.		
	Officers.	Inspections.	Amounts.
Adjutant-General	8	15	\$2,229.64
Quartermaster-General:			
Staff	82	128	71,909,196.54
Post	222	400	3,966,586.34
Subsistence:			
Staff	42	77	16,378,336.89
Post	209	320	1,398,366.11
Medical	12	15	2,582,938.70
Pay	46	65	73,233,901.64
Engineer	66	125	24,116,854.71
Ordnance	27	33	10,575,981.80
Recruiting officers	44	54	105,396.34
National Home for Disabled Volunteer Soldiers	18	15	10,949,407.75
Transport service	43	49	1,240,934.69
Miscellaneous	22	33	13,265,878.50
Total	836	1,329	229,726,009.65

Department.	By officers of Inspector-General's Department.		By other officers.		Under paragraph 978, Army Regulations.	
	No.	Amount.	No.	Amount.	No.	Amount.
Adjutant-General	13	\$1,994.64			2	\$235.00
Quartermaster-General:						
Staff	118	69,660,045.72	2	\$370,106.23	8	1,879,044.59
Post	279	3,074,696.66			121	891,889.68
Subsistence:						
Staff	70	15,517,015.08			7	861,321.81
Post	235	1,115,567.28			85	282,796.83
Medical	15	2,582,938.70				
Pay	61	65,958,886.35			4	7,275,015.29
Engineer	109	21,924,634.20			16	2,192,220.51
Ordnance	29	9,587,818.44			4	1,008,663.36
Recruiting officers	48	101,492.54			6	3,093.80
National Home for Disabled Volunteer Soldiers	15	10,949,407.75				
Transport service	48	1,232,408.33			1	8,526.36
Miscellaneous	32	13,265,818.50			1	65.00
Total	1,072	214,952,219.19	2	370,106.23	255	14,403,684.23
Per cent of total .....		.936		.002		.002

The following summary shows the transactions in the inspection of insular funds by officers of this Department during the fiscal year 1901, so far as considered. In Cuba, 34 officers were inspected 81 times; and in the Philippines, 257 officers were inspected 330 times. The following were the amounts involved:

	Cuban.	Philippines.	Total.
Balances taken up	\$3,233,956.26	38,267.09	3,272,223.35
Received from insular treasury	8,755,455.56	7,029,196.12	15,784,651.68
Received from other officers	763,963.99	3,394,133.54	4,158,097.53
Received from sales	632.95	131,375.19	132,008.14
Received from other sources	2,861,948.50	7,168,145.91	10,030,094.41
Total	15,625,897.06	17,730,117.85	33,356,014.91
Disbursements	1,737,841.49	5,582,596.70	7,320,438.19
Transferred to officers	8,415,653.06	1,667,666.80	10,083,319.86
Deposited in insular treasury	3,303,990.80	5,957,869.33	9,261,860.13
Total	13,457,485.35	16,208,132.83	29,665,618.18
Balance to be accounted for	2,178,411.71	1,521,985.02	3,700,396.73
Distribution of balance—Cuban:			
North American Trust Company			\$845,510.24
Currency			1,332,901.47
Total			2,178,411.71
Distribution of balance—Philippines:			
Hongkong and Shanghai Banking Association			946,188.68
Treasurer of the Philippine Islands			3,139.48
Chartered Bank of India, Australia, and China			575,095.43
United States national banks			861.43
Total			1,525,285.02

CONDEMNED PROPERTY.

During the fiscal year ending June 30, 1901, the total number of inventory and inspection reports received at this office was 6,168, as against 3,521 for the preceding year, and 3,425 for 1899. Prior to that time the average was about 1,700 reports per year. It therefore appears that about 17 such inspections per day were made during the last fiscal year, Sundays included, and the excess of reports received during the year over the largest number received during any previous year was 2,647, and the excess over the former average was about 5,000.

The reports received during the fiscal year 1901 show that 22,516,219 articles were inspected, and that of this number 21,914,832 were condemned, and 601,387, or about 2½ per cent, were retained in service. During the preceding fiscal year 54,134,386 articles were condemned and 716,405, or 1.3 per cent, were retained in service.

Of the articles presented for inspection, 10,601,638 had their original cost price given. Too much importance can hardly be attached to the matter of stating the original cost of property presented for elimination from the public service, as it may be a matter of moment at almost any time to know how great a loss the Government suffers annually from this source. This office has made a strenuous effort to have this matter always observed, and the more especially since it is required by A. R., 981, as well as by note 3 on the back of the inventory and inspection blank, which also has the force of regulations.

Better success is now being had in securing statements of the cost of articles on the inventories, but it has come slowly. It seems that it would be only reasonable and proper for the accountable officer to be acquainted with the cost of his stores, and experience has shown that the cost of articles presented for condemnation is very easily given when an effort is made to constantly give it.

By applying the average value of the articles of which the cost price was given to those of which the cost was not given it is found that the approximate original cost of all the articles inspected during the fiscal year aggregates the sum of \$6,372,290.35, of which articles that cost approximately \$542,161.76 were retained in the service. This would make a per capita per enlisted man of about \$79 for articles condemned, and of nearly \$7 for articles retained in service.

While largely more than twice as many articles were inspected during the preceding year, still their value, as approximated (\$10,009,897.93), was only \$3,637,607.58 in excess of the approximate value of those inspected during the fiscal year 1901.

Appendix E contains a classified tabular statement showing the total amount of property inspected, and its disposition, together with its original cost, so far as shown in the reports, during the fiscal years 1900 and 1901. The tabulation shows a considerable decrease, on the whole, for 1901, though this year presents an increase in the value of post and transport property condemned. It may be that the great general decrease is due to greater care and attention in handling and protecting public property.

A statement of the inspection during the year of about 30 articles of subsistence stores is given in Appendix

F. The figures are large, even as compared with the large similar transactions in the inspection of these perishable articles during the preceding year. The greatest losses, then as now, were in the Philippine Islands; and the deterioration of these stores in such great quantities in those islands is probably due to frequent transshipments and long voyages, in many instances; but the most general cause of deterioration and loss, no doubt, was the unfavorable climatic influences to which the stores were subjected. The tins in which much of the canned goods were put up are said to have been of inferior tin, as well as of inferior make or workmanship; and it has been recommended that special cans, covered with paint or lacquer, be made for the preservation of canned goods that are to be shipped to the troops in the Philippines.

For 1901 the total original cost of these articles was reported as \$308,520.69, as against \$290,020.21 for 1900; and the condemnation in the Philippines alone for 1901 was \$252,915.16, as against \$113,816.28 for the preceding year. The United States shows a considerable improvement; for while stores to the amount of \$84,814.17 were inspected in 1900, the figures on the same articles fall to \$11,631.17 for 1901. There is also a marked decrease this year in the figures for Cuba, Porto Rico, Alaska and Hawaii; while the showing for transports was \$18,885.25 in 1900, and \$20,397.40 in 1901. So it appears that about 82 per cent of these subsistence articles inspected during the fiscal year 1901, so far as their value is concerned, was in the Philippine Islands, while the percentage for those islands in 1900 was only about 39.

The greatest losses in 1901 occurred in potatoes, \$52,999.30 (\$4,188.55 in 1900); onions, \$23,159.61 (\$9,384.71 in 1900); butter, \$40,016.48

(\$1,490.67 in 1900); oatmeal, \$32,451.57 (\$1,295.91 in 1900). These four items constitute about one-half of the total condemnation of the articles of subsistence stores considered in the tabulation for the year. In 1900 the greatest losses occurred in hard bread, \$69,608.57 (\$5,583.72 in 1901); plug tobacco, \$50,275.52 (\$4,427.21 in 1901); bacon, \$44,849.40 (\$30,929.71 in 1901), and smoking tobacco, \$27,300.62 (\$11,770.84 in 1901). It thus appears that deterioration of subsistence stores is liable to vacillate greatly as between different articles. The only articles in which anything like close approximation of loss was maintained during the two fiscal years 1900 and 1901 were, respectively, as follows: Beef, \$13,188.93, \$14,241.44; coffee, \$3,900.05, \$4,498.46; crackers, \$1,969.02, \$2,240.80; pork, \$2,298.87, \$2,944.14; and sugar, \$1,505.74, \$1,908.71. The smallest loss on any article in 1901 was on lard, \$117.04, against \$1,137.07 in 1900; and the smallest loss in 1900 was \$65.56 on canned bacon, against \$421.36 in 1901. In 1900 2,370 dozen eggs, valued at \$549.13, were condemned, but in 1901 no eggs at all were presented so far as the reports received show. Other losses for 1901 were flour, about \$20,000; canned fruits, about \$11,000; ham, about \$13,000; canned tomatoes, about \$13,000. For purposes of comparison, the totals for the fiscal year 1900 for each of the articles considered are included in the tabulation in Appendix F.

The loss in one year of 118,958 pounds of butter that cost \$40,016.46 seems phenomenal. One hundred and thirteen thousand and seventy-three pounds of this butter, costing \$38,444.82, was presented in one lot by the depot commissary at Manila, and, at the time of inspection, fourteen months had elapsed since its first issue. The accountable officer inventoried it as "rancid and unfit for use." The inspector pronounced it unfit for issue and recommended its sale, with the remark: "In regard to this butter, the principal cause of its loss was that it was packed in 3-pound tins. With no ice, people buying it could not keep it after the cans were opened, and there was for that reason no sale for it." With the exception of this one large lot, the butter condemned during the fiscal year 1901 cost \$1,571.64, which seems to be about normal, as the amount for 1900 was \$1,490.67.

The following tabulation from the reports received during the year shows the number of public animals that were inspected, condemned, and retained in service during the fiscal year 1901; and a similar table for 1900 is added for purposes of comparison, to wit:

Designation.	Inspected and condemned.			Inspected and retained in service.		
	Number.	Cost stated.	Number, cost not stated.	Number.	Cost stated.	Number, cost not stated.
FISCAL YEAR 1901.						
Staff	259	\$23,737.02	425	39	\$4,630.00	63
Posts	454	61,868.94	536	51	5,316.70	26
Cavalry	550	66,687.76	899	135	12,137.30	151
Artillery	8	1,206.50	30	2	294.00	6
Infantry	1	60.00	34			15
Volunteer organizations	27	2,521.00	27	8	605.00	10
Arsenals, armories, etc.						
Civil fund	13	362.50	41			
Insular	3	300.00				
Total	1,815	156,743.72	1,992	235	23,073.00	261

¹Three are carabao, or water buffaloes.

Designation.	Inspected and condemned.			Inspected and retained in service.		
	Number.	Cost stated.	Number, cost not stated.	Number.	Cost stated.	Number, cost not stated.
FISCAL YEAR 1900.						
Staff	237	\$21,619.60	455	24	\$2,306.00	164
Posts	59	5,956.75	12	7	540.00	.....
Cavalry	748	85,737.50	363	96	9,789.71	20
Artillery	113	17,152.55	68	33	4,576.75	23
Infantry	115	12,398.55	173	2	210.00	4
Volunteer organizations			1			28
Arsenals, armories, etc.	2	890.00	1			
Civil fund						
Insular						
Total	1,274	143,254.85	1,073	162	17,421.46	239

The total number of public animals presented in 1901 was 2,803, against 2,749 in 1900—an increase of 54, of which 3 were carabaos or water buffaloes. In 1901, 1,315, cost \$156,743.42, were condemned, against 1,274, cost \$143,254.85, in 1900—an increase of 41 animals and \$13,488.57. In 1901, 1,992 animals, the cost of which was not given, were condemned, against 1,073 in 1900—an increase of 919. And there were retained in service 235, cost \$23,073, against 162, cost \$17,421.46, in 1900—an increase of 73 animals and \$5,651.54; and of those, the cost of which was not stated, there were retained in service 261, against 239 in 1900—an increase of 22.

In 1901 the total value of the 1,550 animals, the cost of which was given (55 per cent of the whole number), was \$179,816.72, an average of \$116.01, as against an average of about \$112 for the preceding year. On this basis the total value of the whole number of animals presented was \$325,756.08; and of the 46 retained in the service, \$57,540.96. In the preceding fiscal year, by a similar calculation, the value of all the animals inspected was \$307,776, and of those retained in service, \$44,912.

It is perhaps somewhat remarkable that of the 2,808 animals inspected during the year, 694, or almost 25 per cent, were condemned for total or partial blindness, defective vision, or diseases of the eye that lead to blindness. The greater part of these animals were actually blind in one or both eyes—generally in both. They were distributed as follows, viz:

	Number.	Per cent.
In Cuba	484	0.698
United States	116	.168
Porto Rico	62	.089
Philippines	31	.045
Alaska	1	.....
Total	694	1.000

Two horses condemned in China are included in the 31 credited to the Philippines.

This would seem to indicate that there is in the antilles some predisposing influence to produce blindness in horses and mules—especially in those that are not natives of the islands. This disease, which was

at first supposed to be due to climatic influences, does not yield to treatment, and the veterinarians are at a loss to explain it or account for it, though they have concluded that it is not caused by the glare and heat of the tropical sun, as was at first supposed. In the Philippines, where the climate is much the same as in Cuba and Porto Rico, no such disease appears to exist, so far as indicated by the figures. In these latter islands a great majority of the public animals condemned during the year had the glanders; but it is reported that the disease is now being gotten under control, so that its spread may be largely prevented.

Auction sales. During the year 489 reports of auction sales of condemned property were received, as against 333 for 1900 and 229 for 1899. Many others, probably, should have been received, but were not; still the rate of increase from year to year is somewhat gratifying and encourages the hope that A. R. 761 may soon be fully complied with.

The following tabulation shows in detail, by staff departments, the number of reports received and the amounts realized by the sales they represent during the past two fiscal years, to-wit:

Department.	Reports received.		Animals sold.		Proceeds of sales.	
	1900.	1901.	1900.	1901.	1900.	1901.
Quartermaster:						
Supplies.....					\$26,547.41	\$43,408.00
Horses.....			1,009	1,107	34,824.62	44,384.79
Mules.....	232	332	263	323	8,792.98	17,120.95
Subsistence.....	48	57			16,032.18	5,207.93
Medical.....	18	34			1,088.67	5,561.36
Ordnance.....	8	12			8,501.45	5,011.26
Engineer.....	27	53			4,907.70	8,668.32
Signal.....		1				50.00
Total.....	333	489	1,272	1,440	100,695.01	169,412.61

The total sum realized from these sales is about 24 per cent of the total amount of the value of the whole number of articles presented, as approximated; but in the single item of public animals the similar percentage is 18, an increase of 6 per cent over the preceding year. In every department there was an increase in the number of reports received over those received for the preceding year, the general per cent of increase being 11 and of dollars about 66 per cent.

NATIONAL GUARD.

Lieutenant-Colonel Reade says:

The inspection of the several organizations of the National Guard, State of Minnesota, was made by me in compliance with paragraph 2, Special Order No. 83, Headquarters Department of Dakota, June 20, 1900, which directed me to report in person to his excellency the governor of the State for that duty, while the troops were in camp near Lake City, Minn.

In order to ascertain whether the Minnesota National Guard was apace with professional progress, I prepared, arranged, and submitted to each regimental commander, on the first day of camp, a number of field exercises, problems in minor tactics, suitable for the terrain, organization, facilities, etc., at Lake City encampment grounds, to be solved during the concluding period of the encampment.

This applicatory method of instruction and inspection of officers in tactics and strategy, I was advised, had never before been introduced in the Minnesota National Guard. I was aware that the proposed method of bringing out some of the manifold

situations arising in actual war, methods of execution to be deducted and developed, etc., would be tedious to, and perhaps only mechanical by, some officers; but it was not necessary to urge upon the governor or the adjutant-general of Minnesota that the direct objects of the exercises would sharpen the intellect, assist in reaching decisions rapidly, imparting the substance thereof briefly, clearly, accurately, and enable officers to so direct their troops as to carry out the problems intelligently and properly; hence serve not only to teach, but also to examine the officers as to their attainments and so furnish the basis for a fair estimate of the practical value of the officers in the field.

It was agreed that mere drill tactics and the customary stereotyped ceremonies should be considered in the minimum, while movements and exercises which would find application on the march, in camp, or on the field of battle should be considered in the maximum in determining military efficiency.

The execution of these problems and field exercises by the Minnesota State troops was exceedingly crude.

A common error was that troops retained their close formation, even assumed it, when fired upon. Another was that troops not in a condition to do any effective work charged an enemy after they were no longer worth considering. The mistake of making frontal attacks was a common and disastrous one. The firing discipline was generally bad; litter bearers were poorly instructed; signal men, competent to transmit and receive messages by visual methods, entirely absent; in short, the exercises showed conclusively that the National guardsmen of this State were no more prepared for field work at the time of the inspection than those who, in 1898, entered the volunteer service of the United States. It may, however, have been a surprise to the latter to find that service in the militia was not a complete training for war.

All of these returned volunteers know that radical changes in organization and methods will have to be made.

The first of these changes should be to unify National Guard methods with those of the United States Army. A step toward it would be to have as many officers of the present military establishment as can be spared detailed to give their entire time and attention to the training of State troops in harmony with army methods. Militiamen, as a rule, do not prepare, cook, or eat the army ration when in camp. They should be taught to subsist exactly as regulars subsist.

To render the National Guard an effective force its system should be uniform to that of the Regular Army organization, equipment, armament, instruction, discipline, forms, property issue and accountability, paper work, field exigencies, and staff work.

SUBSISTENCE REPORTS.

During the summer one of the service papers published the reports of more than 30 officers who had commanded volunteers in the Philippines, in regard to the quality and sufficiency of the food furnished them there. Concerning the increase of the ration or sales list, the recommendations were: 7 in favor of more sugar; 1 for more soap; 1 for more molasses; 2 for more fruit and vegetables; 1 suggested that pickles be regularly issued, and 1 recommended the purchase of native beef when there is any difficulty about getting fresh meat. For decreases of certain articles, the following were the recommendations: Two were in favor of less tomatoes; 2 for less bacon, and 1 thought bacon should not be decreased; 1 said tobacco should be added to the ration; 1 stated that champagne should not be supplied except through the hospital, and 1 said that champagne, mineral waters, candies, etc., had proved veritable blessings; 1 officer stated that sauerkraut is craved all over the islands on account of the scarcity of vegetables, and 1 considers canned fruits injurious because the men eat them at irregular times; 1 recommended an emergency ration with the meat component predominant: 1 reported the emergency ration excellent and 1 said it was unpopular; 1 said that canned goods, which require no cooking, are best food for scouting service. There was also some objection to the manner of packing some of the goods. One officer stated that onions and potatoes were to a large extent rotten, and that the bread from Manila was not good.

Twenty-seven officers reported the ration as "good," "excellent," "perfectly satisfactory," "all that could be desired," or some equally as strong commendation; 1 reported it as overabundant and 2 said it was not always satisfactory; 1 said it was poor at times and 6 said there was difficulty in getting sufficient food in certain localities at times, generally on account of lack of sufficient transportation facilities. So far as reference was made to it, the sales department seems to have given satisfaction.

SOLDIERS' HOME, DISTRICT OF COLUMBIA.

The annual inspection of this Home, in compliance with the act of March 3, 1883, and paragraph 966 of the Army Regulations, was made from July 8 to July 12, 1901. Lieut. Col. C. H. Heyl, inspector-general, and Lieut. Col. Thomas T. Knox, inspector-general, accompanied me and rendered valuable aid.

There has been no change in the personnel of the officers since the last inspection, and the general condition of the Home, in all its phases, gives every indication of harmonious and efficient management throughout.

The average present this year is reported as 32 more than last year, and on June 30, 1901, there were 1,389 persons on the rolls of the institution, 830 of whom were present at the Home. The absentees were accounted for as follows:

On outdoor relief.....	407
At Government Insane Asylum.....	27
Absent with leave.....	57
Suspended.....	10
Sick at Fort Bayard Hospital.....	58
Total.....	559

There appears room for approximately 200 additional inmates. At the present rate of increase this available room would seem sufficient for several years to come, but with the augmented Army and the arduous and tropical service they are now compelled to undergo provisions for the accommodation of increased admissions will probably have to be considered.

The buildings and grounds were in excellent police and in admirable condition and repair, though some trouble about foundation and tendency to leakage was indicated. The matter of demolishing the Anderson Building, to make room for an addition to the Scott Building, should be considered with extreme care; and it must be remembered that the Anderson Building, now in good condition and fair repair, stood when the Home was first conceived, and was used by President Lincoln as a summer home, and other Presidents, like Buchanan, Hayes, Garfield, and Arthur, also spent portions of their summers there. The Scott Building is already a huge structure, and the advisability of making further additions may be open to question, and possibly if a new amusement hall is needed and wanted it may be better to build it as a separate structure, or an amusement hall and mess hall combined, and with over 500 acres to select from, no doubt an eligible site could be determined on without the necessity of razing such a traditional and historic building as the Anderson.

There has been a slight reduction in the number on outdoor relief from the figures reported on June 30 last year. The members receiv-

ing this relief are paid, in lieu of the benefits of the Home, sums ranging from \$2 to \$8 per month, and averaging about \$7. Thus it will be seen that they receive approximately \$84 per man per year, as against a per capita cost stated as \$211.86 for the year at the Home. The per capita cost at the Volunteer Home for the year 1900 was reported as \$130.91.

But 9 per cent of the members committed breaches of discipline during the year. This record compares favorably with any of the Soldiers' Homes. There were 124 trials for drunkenness—2 more than last year. Passes are granted with a liberal hand to those who have not transgressed the rules.

The accounts, books, records, and disbursements of the treasurer's office were examined from July 1, 1900, to June 30, 1901. During this period the aggregate expenditures from the Home fund were \$347,835.50, or about \$30,000 less than last year, due to less special construction. The expenditures were analyzed as follows:

Purchases, excluding subsistence	\$72, 794. 21
Purchases of subsistence	50, 671. 30
Paid for services	84, 180. 63
Paid for outdoor relief	34, 640. 93
Paid for permanent improvements	105, 548. 43
Total	347, 835. 50

The condition of the permanent fund may be stated as follows:

Balance in the Treasury July 1, 1900	\$2, 556, 741. 68
Credit settlements	511, 825. 71
Total	3, 068, 567. 39
Drawn for current expenses	248, 000. 00
Balance in the Treasury June 30, 1901	2, 820, 567. 39

This balance is the largest shown for some time, and the settlement made by the Treasury Department for the June quarter, 1901, carried a credit of \$226,231.26, and this sum was but \$2,493.61 less than the whole amount credited for the year 1900.

The balance now in the Treasury at the present rate of interest will nearly support the Home, on last year's basis, for one quarter.

The interest account shows the following changes for the year:

Balance in the Treasury July 1, 1900	\$18, 992. 59
Interest on deposits	80, 811. 62
Total	99, 804. 21
Payments to the Home	78, 921. 10
Balance in the Treasury June 30, 1901	20, 883. 11

The number of pensioners was reported as 676 on June 30, 1901, an increase of 50 since July 1, 1900. This account shows the following transactions:

Balance on hand July 1, 1900	\$48, 491. 53
Received from United States pension agent	107, 285. 33
Total to be accounted for	155, 776. 86
Paid to pensioners	105, 180. 91
Balance on hand June 30, 1901	50, 595. 95

This balance pertained to 335 pensioners, 6 of whom had over \$1,000 each to their credit and 19 between \$500 and \$1,000. A large balance in this fund is habitually kept and appears unavoidable, but possibly some arrangement could be made to enable it to earn a fair rate of interest.

The records, books, and accounts appeared to be accurately and neatly kept, and the affairs of the treasurer's office seemed well in hand.

It is understood that the fiscal year at this Home, which arbitrarily ended September 30, will be made to conform to the usual custom and end June 30, as recommended by this Department for several years past.

The employees numbered 357 during the year, to whom were paid \$80,381.32, and the average per employee per annum was \$225.15. This sum is over 20 per cent more than the average price paid at the Volunteer Homes in 1900. The number of the employees has increased from 275 to 357, or 23 per cent, since 1897.

The supply departments were in good condition, and the storage facilities seemed convenient and ample. The food appeared well cooked and served and of sufficient variety, though the kitchen appliances are somewhat antiquated and not up to the standard of some of the Volunteer Homes. In this connection it might be well to authorize the treasurer and surgeon to accompany the officer of the Inspector-General's Department, for the purpose of comparison and observation, to some of the Volunteer Homes, when the latter officer is making the annual inspection of them.

The material, fit, style, and general condition of the clothing of the men appeared satisfactory, and the neat straw hat issued at this Home is a decided improvement over the summer head-gear at some of the Volunteer Homes.

There appears to be sufficient fire protection and the apparatus is frequently tested and was in good condition at the time of the inspection.

Two hundred and fifty acres were under cultivation in the farm, and the dairy herd consisted of 43 cows, 10 heifers, 2 bulls, and 5 calves. An abundance of milk is served at the meals, and during the year the herd produced over 29,000 gallons, at a valuation of \$5,863.65. The police of the barn and dairy was good.

The new annex to the "Barnes Hospital" has been completed and is now occupied. This building increases the capacity of the hospital to 112 beds, or 24 per cent. Three thousand three hundred and twenty-eight cases were treated during the year, an increase of 772 over the number reported for last year. Ninety-six deaths occurred among the members, 42 of which were in the hospital proper, 52 outside the grounds, and 2 in other parts of the reservation. The average age at death is nearly three years less than at the Volunteer Homes, but the death rate per 1,000 of the whole number cared for appears to be nearly 5 greater. The rollers have been removed from the beds and rubber substituted, which makes a decided improvement in alignment and solidity. The question of female nurses to replace the male inmates serving in that capacity should be given consideration. Female nurses have long been employed at the Volunteer Homes, and, as they are selected from women who have made nursing a profession, give eminent satisfaction.

NATIONAL HOME FOR DISABLED VOLUNTEER SOLDIERS.

The act making appropriations for the sundry civil expenses of the Government for the fiscal year ending June 30, 1902, and for other purposes, approved March 3, 1901, contains the following new legislation:

Provided, That the accounts relating to the expenditure of all public moneys appropriated for the support and maintenance of the National Home for Disabled Volunteer Soldiers shall be audited by the Board of Managers of said Home in the same manner as is provided for the accounts of the various departments of the United States Government and thereupon immediately transmitted directly to the proper accounting officers of the Treasury Department for final audit and settlement.

The effect of this proviso is to abridge and partially eliminate the audit and supervision heretofore exercised by the War Department, as provided for in the acts of March 3, 1875, March 3, 1891, and March 3, 1893, and assigned to this Bureau by the following order of the Secretary of War, dated December 23, 1892:

All matters pertaining to the supervision of the accounts of the receipts and expenditures of the National Home for Disabled Volunteer Soldiers are assigned to the Inspector-General of the Army, who will submit the same to the Secretary of War for action, as required by the act approved March 3, 1891. (26 Stat. L., p. 984.)

The above-cited proviso was considered ambiguous as to its scope, and it was not clear whether the preparation of requisitions for funds, as provided for in the act of March 3, 1875 (18 Stat. L., p. 343), was to continue to devolve upon the War Department, whether the bond given by the general treasurer was to be supervised, and whether the annual inspection in accordance with the act of August 18, 1894 (28 Stat. L., 412): "That hereafter, once in each fiscal year, the Secretary of War shall cause a thorough inspection to be made of the National Home for Disabled Volunteer Soldiers, its records, disbursements, management, discipline, and condition, such inspection to be made by an officer of the Inspector-General's Department, who shall report thereon in writing, and said report shall be transmitted to Congress at the first session thereafter," was still to be made. The matter was referred to the Judge-Advocate-General for a legal decision as to the status of the War Department in view of the new legislation, and, under date of April 24, 1901, the following decision was rendered by the above-named officer:

* * * * *

The act of March 3, 1875, required an account of all receipts and expenditures for the quarter immediately preceding to be rendered to the Secretary of War, "with vouchers for such expenditures."

Question arises as to whether this account shall still be rendered since the proviso of March 3, 1901, has been enacted?

The accounting officers of the Treasury Department audit these accounts for the purpose of determining whether the disbursements are legally made, and the proviso gives the Board of Managers the right to make a preliminary auditing before transmitting them direct to the accounting officers of the Treasury. This does not, however, relieve the Secretary of War of his duties as to approving quarterly estimates, and without which he can not issue warrants upon which the money appropriated for the support of the Home may be drawn from the United States Treasury and turned over to the treasurer of the Home. To perform these acts it is necessary that there should be rendered to him the account required by the act of March 3, 1875, as otherwise he can not know what balances of the quarter's funds remain unexpended, or whether the amount expended has been applied in accordance with the estimates he has approved, or whether the estimates are made with due economy and should be approved.

The account to be rendered is no longer to be accompanied "with the vouchers for such expenditure," as they are only necessary to the legal expenditure of the funds, a matter of auditing over which the accounting officers of the Treasury have final jurisdiction and consideration, of which is no longer vested in the Secretary of War.

The duty of causing the annual inspection of the Home to be made and transmitted to Congress, as required by the act of August 18, 1894, still remains unmodified; so likewise the duties as to bonding the general treasurer of the Home, under the acts of August 19, 1894, and March 2, 1895.

I am of the opinion, therefore, that the order of the Secretary of War of December 23, 1892, remains in force as to the Inspector-General's Department, in so far as is consistent with the foregoing views.

The scheme of accounting in vogue prior to the proviso in the sundry civil bill approved March 3, 1901, was carefully considered by a special joint committee of both Houses of Congress, and its application is so general and accepted by the Government as the best to guard against any scandal or misuse of the public funds that any departure therefrom should be jealously guarded.

An audit by the Board of Managers, which is not recognized as a department of the Government (see Comptroller's Dec., 1500), can scarcely be held to be such an administrative examination as is contemplated by the act of July 31, 1894, as it would be an audit of its own accounts by its own agents, who are under no obligations to the General Government and who have not filed an oath of office. The unique spectacle now presents itself of the Secretary of War being compelled to draw requisitions for funds for the support of this vast institution on the bare statement in figures, unaccompanied by vouchers or receipts of any kind that an amount has been expended, and that so much more will be needed for disbursement in the coming quarter, and the supervisory scrutiny exacted of other appropriations under the Secretary of War, and considered by such eminent authority as the Hon. Alexander M. Dockery in a speech on "Improvement of business methods in the public service," May 2, 1894, in the following words, considered of great weight, is to be abridged:

It is contended by gentlemen who are opposed to this bill (Dockery bill) that the administrative audit under the present triplicate system of examination should be abolished and accounts and claims sent directly to the Auditor, whose examination should be reviewed by a comptroller. It seems to me, Mr. Chairman, that an administrative examination is of paramount importance. Congress commits to the administrative departments the expenditure of vast sums of money, much of which in its detail is necessarily matter of regulations by the administrative departments.

It is understood that this account drew the attention of the experts of the Dockery Commission, and that the settlements were so long delayed that at one time the amount standing on the books of the Treasury Department was \$7,229,243.29. Business methods were applied, new vouchers, forms, etc., devised, and fresh rules and regulations governing the expenditures were promulgated on September 7, 1893, by the Secretary of the Treasury, largely due to efforts of this Department. The account was practically up to date on the passage of the proviso before mentioned, as when the last statement was received from the Auditor (May 11, 1900) it showed a balance due the United States of but \$538,348.13 and an actual difference of only \$727.55. The vouchers and papers are now rendered in admirable shape, and the exceptions to the expenditures are in the main confined to minor errors and omissions, as a rule capable of satisfactory explanation. As a matter of fact the condition of this account is far different

at this time than when it was assigned to this office, as will be admitted by all who are familiar with it.

And as a further illustration of the value of a close and judicious supervision and inspection reference is but to be made to the small tabulation below, compiled from the reports of the Board of Managers, showing the per capita cost of maintenance and the average cost per capita for the general expenditures for the past ten years:

Year.	Average present.	Average cost per capita for maintenance.	Average cost per capita, general expenditures.
1890.....	12,935	\$141.07	\$176.54
1891.....	13,931	139.50	174.77
1892.....	14,196	143.75	174.13
1893.....	14,661	140.95	164.04
1894.....	15,601	127.45	147.22
1895.....	16,480	115.80	133.79
1896.....	17,454	111.60	130.51
1897.....	18,173	119.23	128.63
1898.....	18,556	117.84	130.36
1899.....	18,814	123.97	155.92
1900.....	19,230	130.91	153.82

It will be observed that when the supervision of this Bureau began (1893) the per capita cost for maintenance had reached \$140.95, and for several years prior was near that figure. In 1894 it dropped to \$127.45, or, in other words, it took \$13.50 less to subsist a member. In 1896 the cost per capita for maintenance had been reduced to the remarkably low figure of \$111.60, or nearly \$30 per member less than when the accounts were assigned to this Bureau. And even with the enhanced price of necessities, occasioned by the Spanish-American and foreign wars and to other causes, the per capita in 1900, the last full year we supervised, is still over \$10 less than when the supervision began. It can not be said that the men have been denied anything needful during this period, for they received no more then than now, and the inspections of these Homes illustrate that the veterans are exceedingly well cared for by the management at the rate per capita of the present time. It will be noted that when a reduction of even \$10 per man is applied to over 19,000 men the aggregate means a considerable sum, but the average saving has been very much over this amount, and should the per capita of 1893 be maintained through the succeeding years it can be readily seen that the expenditures must have been increased by several million dollars. These points speak for themselves and were probably given due consideration before the adoption of the proviso in the sundry civil bill approved March 3, 1901.

The policy of this Department has always been to carry out and make effective the various acts of Congress and the influence to which this supervision and inspection contributed may be briefly stated as follows:

The disbursements have been kept within the limits of the specific appropriations; the accounts have been more promptly rendered; the disbursing officers' balances have been kept on deposit with authorized depositaries; the president of the Board is no longer its disbursing officer, nor formally approves his own vouchers; the general treasurer is bonded to the United States; original bills are submitted with all vouchers; all purchases are made by contract or under competition, except in cases of emergency; construction is limited to special

authority therefore by Congress; most of the expensive depot methods have been discontinued; the appropriations for clothing have been consolidated in the interest of economy; the general expenses of the management brought within limitations; each manager submits his own account for his expense; the idle posthumous fund, amounting to over \$152,000, was made available for disbursement; the amount of surplus funds kept on deposit has been materially reduced; the merging of the posthumous account into the general account, thus reducing the number of accounts and requiring accounting for the effects of deceased members; the classification of employees; the proper disposition of the proceeds of sales; the separation of the cost of repairs from that of construction; the promulgation of new rules and regulations; constantly increasing population has been supported out of occasionally decreasing appropriations and a progressive decrease in the per capita cost between the years 1893 to 1899. Such things as the penalty envelope, and the numbering of the vouchers for the year, instead of quarterly, might also be mentioned as in the line of progress.

Prior to the supervision by the War Department only comparatively small sums were covered into the Treasury from these appropriations, but since 1893 sums aggregating in round numbers \$1,300,000 have gone to the credit of the surplus fund to be reappropriated, with a balance of over \$180,000 pertaining to the appropriation 1900 available for this disposition. The annual inspection of the various Branches of the Home for the fiscal year 1901 was made by Maj. Thos. T. Knox, inspector-general, assisted by Mr. D. C. Spencer, beginning at the Eastern Branch July 21, 1900, and ending at the general offices November 12, 1900.

Major (now Lieutenant-Colonel) Knox reports the condition of the Home and its Branches as admirable, and among other recommendations states that the time is fast approaching when these institutions will become practically a vast hospital, and the appointment of a medical man of a large experience and known ability as chief surgeon becomes more and more apparent. In this connection it may be well to reiterate the remarks of Col. Dallas Bache, assistant surgeon-general, U. S. A., of October 28, 1896, contained in a letter to the Surgeon-General of the Army, after an inspection of the Southern Branch:

* * * Colonel Bache, who is one of our most efficient medical officers, thinks it extremely important that there should be some central medical authority * * * who should have supervision of matters relating to the purchase and issue of medical supplies, to reports relating to the sick, and, in short, the general administration of the hospital department. His inspection leads him to think that there is great need of a standard supply table and of a careful supervision as to the use of medical supplies; also that the available data relating to the diseases of the old soldiers should be carefully collated and an annual report made by some one having the necessary experience and authority to make the best possible use of such data in the interest of scientific medicine. * * *

A discrepancy of some \$1,704.65 was discovered at the Central Branch pertaining to deceased soldiers. This money was turned in to the treasurer by the surgeon, but was found to be short when checked at the time of the inspection. It has since been made good by the treasurer, and he has been relieved.

The number of deaths was 1,472 for the year 1900, or 118 more than in 1899. This was 47.89 per thousand of the whole number cared for. The average age at death was 67.12 years.

The inspection for the current fiscal year is now being made by

Lieut. Col. Thomas T. Knox, inspector-general, assisted by Mr. A. B. Horner.

The usual tables submitted with this report will have to be omitted, as the vouchers and accounts do not now come to this office. The appropriation account may be stated as follows:

Appropriations.

Appropriations.	Certified claims.	1898 and prior years.	1899.	1899 and 1900.	1900.	1901.	Total.
Balance in Treasury June 30, 1900.....		\$907.58	\$178,962.05		\$232,934.75	\$2,978,450.00	\$3,391,254.38
Amount of appropriations.	\$25.23	188,000.00		\$2,000	5,467.06		195,492.29
Unexpended balance deposited		2,073.54	17,976.67		103,341.03		123,391.24
Total	25.23	190,981.12	196,938.72	2,000	341,742.84	2,978,450.00	3,710,137.91
Remitted to disbursing officers		188,907.58		2,000	157,730.21	2,978,307.78	3,326,945.57
Paid on Treasury statements	25.23		213.91		794.13	142.22	1,175.49
Covered into surplus fund.		2,073.54	196,670.70				198,744.24
Total	25.23	190,981.12	196,884.61	2,000	158,524.34	2,978,450.00	3,526,865.30
Balance in Treasury June 30, 1901.....			54.11		183,218.50		183,272.61
Total	25.23	190,981.12	196,938.72	2,000	341,742.84	2,978,450.00	3,710,137.91

WATER TRANSPORTATION.

The inspection, by officers of the Inspector-General's Department, of the transports belonging to, or chartered by the Government, which was inaugurated in the fall of 1899, under your instructions, has been very thoroughly made during the year, and it is believed that the results have been very beneficial and that the service has profited from the reports of these impartial, conscientious inspectors, who by study as well as experience endeavor to keep well informed on all matters coming within the scope of their duty. The records show that 25 Government and 29 chartered transports were inspected by 16 officers 214 times during the year. These inspections were made at the following ports, viz: New York, N. Y., 13; San Francisco, Cal., 66; Manila, P. I., 126; Havana, Cuba, 2; Santiago, Cuba, 1; and San Juan, P. R., 6. In addition to the reports received of these inspections there were also received for the year 34 reports made under paragraph 199, Regulations for the Army Transport Service, by officers traveling in command of troops on board. These latter reports are extracted for chiefs of bureau the same as the regular reports; and, while some of them have indicated a lack of familiarity with the provisions and requirements of the transport regulations on the part of the authors, they have generally been found very valuable in enabling this office to communicate to the inspector at the home port any information of importance concerning the actual workings of the ship as observed at sea, its condition, and needs as to equipments, accommodations, and personnel.

At the beginning of the last fiscal year there were 11 owned vessels on the Atlantic and 14 owned and 11 chartered on the Pacific. To meet the needs of the service in transporting troops, animals, and supplies to China and the Philippines there were chartered during the

year 23 ships. One ship, the *Dir* (*Samoa*), was purchased for the Pacific fleet. At the close of the fiscal year there were in the service 26 owned and 6 chartered transports. The transports running to Cuba and Porto Rico were discontinued June 30, 1901, and water transportation for the West Indian service provided for by contract. Three owned and 2 chartered transports were engaged in the Alaskan service. These were increased by the *Laurton*, which on one return trip from Alaska brought 827 citizens, 775 of whom were in destitute circumstances. The *Seward*, plying between Seattle and Alaska, and the *Ingalls*, which had been in service in the West Indies as an inter-island transport and dispatch boat, were not inspected.

The transport service was established in the rush of a great emergency, necessitating the purchase of the best vessels available at the time, and their rapid conversion into troop ships, and, under the circumstances, it would be unreasonable to expect them to be types of perfection. The reports show that as a rule they were generally in good condition, though most of them were criticised in one or more details. There is, however, every indication of steady improvement, and the defects will no doubt gradually disappear with time and experience. There were a few instances of overcrowding and some discomfort occasioned by exigencies of the service, such as the hurried transportation of troops to China, and these exceptional conditions were met by officers and men with soldierly fortitude. On the whole, the actual work of transportation has been well done.

The ventilating systems of 9 of the Government and 6 of the chartered transports were reported unsatisfactory, inadequate, or not modern, and there is evidently a very great difference between the enlightened ventilation of modern passenger steamers and commercial boats and the mere electric fans, which are regarded as indispensable to some of our transports.

It does not appear from the reports that any of the Government transports are provided with a detention ward. Several are reported to have no isolation ward and 14 no laundry facilities.

The crews were generally reported to be satisfactory and efficient. Three inspectors-general reported the crews excessive in number or cost as compared with those of commercial steamers.

In the early part of the year some complaints were received in regard to the system of storing baggage on transports, under which the property of different organizations became mixed, causing much confusion and delay upon reaching destination. This matter was brought to the attention of the proper bureau, and has, no doubt, received necessary action. It is unquestionably in the interest of efficiency to have the property of each organization stored separately on the transport and placed in a separate pile when landed. The loss of a number of packages of property and stores in transit, which has been reported, would seem to call for a better system of checking, watching, and responsibility in this respect.

The immense expenditures on account of the transport service attract attention and demand constant watchfulness and careful supervision and scrutiny, so that the public interests may be properly safeguarded. In altering and repairing transports it is reported that the sum of \$4,000,000, approximately, was expended at San Francisco alone up to February 25, 1901. Two illustrations of expenditures on boats are given: The *Sumner*, which was purchased for \$168,000,

has had expended on her for fitting up \$650,000, and for repairs since \$100,000, making a total cost to the Government of \$918,000; and the *Warren*, which was purchased for \$200,000, has had expended on her for fitting up \$148,194, and for repairs since \$194,341, making a total cost to the Government of \$542,535.

Detailed information as to the condition of each transport, together with interesting tabulated data taken from the reports, is given in Appendix C.

Attention is invited to the following extracts from reports of inspectors-general relative to the transport service, and especially to the remarks of Colonel Sanger and Lieutenant-Colonel Maus on the very important subject of reduction of cost of coal:

Lieutenant-Colonel Maus (California) says:

General remarks. In point of efficiency and comfort there has been a steady improvement in this service. There are still defects and deficiencies, and at times there has been overcrowding as well as discomfort. In the fitting out of some of the transports the requirements of the United States navigation laws have not been fully carried out, the exigencies of the service causing variations under the circumstances necessary. There is at this date, however, a more rigid enforcement of the regulations regarding air space, ventilation, and other requisites.

Some of the transports have not been furnished with isolation wards, which in the case of the *Lawton*, on the last trip, proved to be a serious matter. Contagious diseases are liable to break out at any time, and such accommodations should never be omitted. Two transports touched at Honolulu (the *Lawton* and *Kilpatrick*) with cases on board during my inspection there in April.

The *Indiana* and *Pennsylvania* (chartered) have never been suitable as transports nor properly fitted out. The ventilation on both of these ships is inadequate and the air and deck space too contracted for comfort. On long voyages especially there should be sufficient room on deck for the exercise necessary for health.

Although transports owned and fitted out by the Government have been generally fairly well ventilated, it is strongly recommended that the dual system (the forced and exhaust) be installed when possible in the future, to insure perfect ventilation, and, in accordance with the requirements of law, never more than two tiers of berths be allowed. * * *

There has been expended here in alterations and repairs on transports up to date approximately \$4,000,000. Some of these ships are old and more or less obsolete in structure. They consume large quantities of coal and are by no means what would be considered to-day as economical ships. The *Meade*, especially, ought to be gotten rid of at as early a date as possible. She carries practically no freight, requires constant repairs, burns enormous quantities of coal, besides being too cumbersome. * * *

I again renew my recommendation of last year that if our transport service is to be placed upon a permanent basis, in order to insure comfort and to meet all the demands of modern transportation, ships should ultimately be constructed for the service for both troops and animals. Troop ships should also have accommodations for the horses of mounted officers of organizations, who, otherwise, are separated from their needed mounts and not thoroughly efficient.

The importance of having ships especially built for the safe and serviceable transportation of animals has already been referred to in my report of last year, to which attention is again invited.

Col. J. P. Sanger (Philippines) says:

Considering the very hurried establishment of the transport service, necessitating the purchase of such vessels as were available at the time and their alteration into troop ships, it is most creditable to those who have inaugurated and managed it. There are defects, no doubt, but they will be corrected with time and experience. In the trans-Pacific business all vessels carrying troops should have twin screws, as an accident to the single shaft in mid ocean might and probably would prove a serious disaster.

Lieut. Col. S. C. Mills (Philippines) says:

Isolation wards should be placed on all transports, and they should be so placed as to insure isolation. There is always some danger of smallpox appearing among

troops returning from here. It appeared on at least two transports taking home volunteer regiments. * * *

As regards staterooms for ships' officers, I do not think the deck officers should be put two in a room. At sea their duties are onerous and of a great responsibility, and in bad weather they may be on duty for many hours at a time. They should be well and comfortably housed. When possible all deck officers should room on the bridge deck, as is now the case on the *Shuridan*, away from all contact with passengers and from the noise of the promenade deck, since watch officers must sleep during the day. There is an abuse in the assignment of rooms to clerks, quartermasters, and ships' surgeons.

Lieutenant-Colonel Maus (California) says:

Purchases. The purchases for transport service at date of inspection averaged about \$125,000 per month. Of this amount three-fifths are made in open market. Standard articles for the fitting of transports, which could be kept on hand and supplied from issues, have been purchased in this way, and there ought to be a large reduction in such purchases.

There is a general class of articles that are always needed in the supplying of transports, such as towels, linen of all kinds, blankets, etc. They should be made for the service, properly marked to prevent loss, and kept on hand for issue. This arrangement would certainly be economical and desirable in every way and prevent delay in supply.

Col. J. P. Sanger, inspector-general, Division of the Hospital ship *Relief*, Philippines, in a special report recommended that the hospital ship *Relief* be ordered to the United States and sold, as she did not meet the demands of the service and was very expensive.

By General Orders, No. 192, Headquarters Division of the Philippines, July 25, 1901, it was directed that as the hospital ship *Relief* was no longer required for service by the Medical Department she would discontinue service as such, and the control of the vessel would pass from that Department to the Quartermaster's Department.

Colonel Burton (Cuba) says:

Pilotage. In my report of the inspection of the Transport *Ingalls* I called attention to the large sums expended for pilotage. I do not know if the same conditions in this respect obtain in the Philippines, but think it is probable that they do; in which case attention should be called to the matter, as there, with so many transports in the service, the expense would be a heavy one.

Lieutenant-Colonel Maus (California) says:

Coaling. San Francisco, Honolulu, Manila, and Nagasaki are the principal coaling ports. All the regular transports, including those chartered, are supplied with coal at Government expense. At San Francisco, Honolulu, and Manila, Australian coal is habitually used. Transports sailing from Puget Sound have been generally supplied with either Canadian or Washington coal.

This is a very important subject, and in my opinion has not received adequate attention by the transport service. It is observed that coal of very good qualities and at low prices which give results is obtained on Puget Sound, either from the Washington or Canadian mines.

Pocahontas coal, which has been used in the Navy many years and is preferred to all others on account of its superior steaming and other qualities, is landed at Honolulu for less than the cost of Australian coal there, which is inferior and a foreign product. * * *

I was informed by the quartermaster that coal landed at Honolulu and placed on shore in the pile costs \$10 per ton.

Since July 1, 1900, there have been issued 17,673 tons.

The kinds received are Nanaimo (Canadian), Hetton, Greta, New Wallsend, Pacific Cooperative and Northern Extended (all Australian). Nanaimo coal has not been furnished of late on account of complaints made. Some of the Australian coal received has been of inferior quality. A fire broke out from spontaneous combustion in a pile of about 5,000 tons, due undoubtedly to impurities. Of this 90 tons are reported to have been destroyed, but a large amount of the remainder was injured and its steaming qualities impaired.

Transport coal is put on several different lots and is unprotected from the weather.

There was no regular watchman to guard it, either by day or night. The timekeeper is said to act as watchman, but it is evident that his watching is not worth considering. He is employed in the daytime, and it is impossible for him to watch at night. There was reported to be on hand at date of inspection about 7,700 tons. It was observed that all navy coal is sheltered in well-built sheds. Coal, especially certain kinds, deteriorates largely from exposure. The best authorities agree that there is considerable loss in steaming qualities from action due to rain and hot weather. Shelter should be provided.

I made careful inquiry regarding the coal supplied the Navy, as to the cost, quality, and desirability. There was a large supply of Pocahontas coal on hand at the time. This coal comes from western Virginia, and is preferred by the Navy on account of its special steaming and other qualities. It is stated that it is greatly superior to Australian coal and is cheaper. Captain Pond, in command of the naval station (Honolulu), gives its cost at \$8.25 per ton.

It would certainly seem desirable for the transport service to purchase this coal if it can be obtained, not only on account of its superior quality but also on account of being an American product.

The steaming qualities of some of the Washington and Canadian coals appear to be very good. Fifty thousand tons of one kind of Washington coal alone is reported to have been used by transports. The cost of this coal, Major Ruhlen reports, according to latest contracts, is \$3.36 per ton, stowed and trimmed in ship's bunkers, either at Seattle or Tacoma. Comax coal is offered under the same conditions at Union, British Columbia, for \$3.75. The Comax coal is probably nearly as good as the Australian coal, and is largely used by the Navy. The price of Australian coal has varied. From information furnished by one of the largest steamship companies in Honolulu, in 1889 it cost \$6.50 to \$6.75 per ton and in 1900 \$7.78 to \$8 per ton.

The cost of stevedoring to transports here is very high. To load and trim it into the ship, after it has been brought to the wharf, costs \$1.10 per ton. I consider this price excessive. I was informed by Captain Pond that he had loaded a war vessel at about 85 cents a ton, giving the work to a man not connected with the stevedore companies.

Allen & Robinson, who are perhaps the largest dealers in Honolulu, offered me large quantities of the best grade of Australian coal, in the pile, for \$9.25 per ton. From other information I am also of the opinion that a contract can be made with one of the steamship companies, which keep large supplies in Honolulu, to supply coal to transports at prices less than the Government now pays. This would also prevent certain losses to which our coal is now subjected.

Colonel Sanger (Philippines) says:

* * * It is quite evident that no very great reduction in our coal expenditures can be made until we are able to reduce the cost of coal in San Francisco. To this end, I beg leave to offer the following suggestions: Why should we pay \$10 a ton for Nanaimo coal when we can get it for less money, and why should we buy Australian coal at all? I am reliably informed by Major Robinson, the captain of this ship, and by Captain Pierce, of the *Sheridan*, that the price of Nanaimo coal in large quantities f. o. b. has averaged \$3.50 and even less for some time past. I have also been informed that it can be carried to San Francisco, either in our own or hired colliers, at not to exceed \$1.10 to \$1.25 a ton, making the cost of the coal, including duty at 70 cents, in the neighborhood of \$4.50 to \$5 per ton. Using the same amount of coal and coaling at San Francisco and Nagasaki, in place of San Francisco, Honolulu, Manila, and Nagasaki, as is now the practice, the coal bill of this ship for the round trip to Manila would be about as follows:

San Francisco, 2,000 tons, at \$5.50 per ton	\$11,000
Nagasaki, 4,000 tons, at \$3.30 per ton	13,200
Total	24,200

a saving of about 56 per cent. While these figures may not be strictly correct, I am quite sure they are closely approximate, and at all events may serve as a basis for a more thorough inquiry in respect to an important measure of economy. The entire question of coal supply in these waters is worthy of very close attention if a reduction in our transport expenses is to be effected. * * *

The coaling arrangement in San Francisco could be very much improved and the cost reduced if the Government would buy its coal on Puget Sound, ship it to San Francisco in Government colliers, and establish a suitable coal dock in the harbor. All bills for the purchase of coal should be certified by the quartermaster and engineer of the transport, and all repairs by the quartermaster and captain of the transport. This ought to be a sufficient protection to the Government.

Lieutenant-Colonel Lovering (Philippines) says:

There is about 20,000 tons in coal hulks in the bay. The issues are from 8,000 to 15,000 tons per month. The coal appears to be of fair quality—a large percentage is fine—and it is inferior to the soft coal of the Eastern States (United States). Most of the coal comes from Australia and Japan.

Lieutenant-Colonel Maus (California) says:

Clerks and crews. The crews of transports are, as a general rule, much larger than those on ocean liners, and a large reduction in expense could be made in this respect.

The steward's department is very much in excess of those on liners, where the cabin passengers greatly exceed those on transports and where there are also a large number of steerage passengers. This may be demonstrated by comparison with almost any liner.

On my voyage to Honolulu I looked more minutely into this matter, although the subject had attracted my attention at an earlier date. I went over on the *Hancock* and returned on the *Mariposa*, of the Oceanic Steamship Company. The *Hancock*, with a gross tonnage of 6,000 and a net tonnage of 2,657, had a crew of 175, while the *Mariposa*, with a gross tonnage of 3,200 and a net tonnage of 1,939, had a crew of 96. There were in the steward's department of the *Hancock* 52 persons, while in that of the *Mariposa* there were only 38. The *Hancock* only carried 50 cabin passengers, while the *Mariposa* carried 200 cabin and second-class besides a number in the steerage.

In the number of the clerks there should undoubtedly be a large reduction. A transport quartermaster is allowed the following clerks: One quartermaster clerk, 1 commissary clerk, an embalmer, who performs the duty of a clerk; 1 freight clerk, and 1 gunner, whose duties are nominal and who may be used as a clerk, besides a commissary-sergeant. The pay of these clerks amounts to \$425 per month, without considering the commissary-sergeant.

I believe that the services of either the quartermaster or commissary clerk could be dispensed with and that the work of the gunner could be done by some member of the crew. This would make a reduction of \$150 a month. When all of the transports are considered, this saving alone would aggregate a large amount annually.

The purser on the *Mariposa*, who handles large quantities of stores of various kinds, including hundreds of tons of sugar, had entire charge of the accounts of the ship and performed his duties without any clerk, while the steward also performed his clerical work without clerical assistance.

The ship's officers on transports occupy too many staterooms, a number of them having rooms entirely to themselves, which largely reduces the quarters available for transportation of officers. With the exception of the chief officer of each department it would appear reasonable to require two of all other officers to occupy the same stateroom.

Colonel Burton (Cuba) says:

I fully agree with Colonel Maus in his observations in regard to excess of crew on United States transports—vide my report of inspection of the transport *Ingalls*, April 23, 1900, in which it is stated: “* * * When Captain Fedendall first took charge of this vessel she had, all told, 90 men as opposed to 78 at present. * * * A ship of this tonnage in commercial trade will carry, all told, about 36 men. In my judgment a very liberal allowance, sufficient under all circumstances for the *Ingalls* in her present service, would be 65 men all told.” Also report of inspection of the transport *Crook*, November 7, 1900: “* * * The crew consists of 143 persons * * *. In commercial trade this vessel would carry about 125 men for the service in which she is now engaged. I consider her present crew extremely liberal in number.”

I likewise agree with the remarks of Colonel Maus regarding the excess of clerical force in this service, and think that the services of either the commissary or quartermaster clerk could be dispensed with.

Colonel Sanger (Philippines) says:

From such experience and observation as I have had, I should say that some reduction in the steward's department of our transports is practicable, and that the embalmers might be dispensed with, the ship's surgeon performing their duties, when necessary, at \$10 or even \$20 per body.

A staff sergeant and two clerks ought to be sufficient in the freight department. * * *

There is another way to reduce the expenses of the transport service to which I

wish to invite attention, and that is by changing the personnel and wages of the crews. * * * The Government transports are paying more than twice as much as merchant steamers of the same tonnage. This, of course, is due to the fact that the crews of merchant steamers are largely composed of Chinese, while the crews of our transports are taken from our floating population, and usually idlers picked up a few days before sailing. They represent the poorer class of seagoing people, are restless, and have no intention, as a rule, of remaining permanently in the transport service. I understand that formerly Chinese were employed on this transport and gave great satisfaction, being excellent sailors, waiters, firemen, and coal passers; sober, economical, and reliable and anxious to retain their places. Through the agitation of the labor unions in San Francisco, our transports have been deprived wholly or in part of their valuable services, and I suggest, therefore, that the Government employ Filipinos as a substitute for them. The best cabin boy in this ship is a Filipino, and it is believed that he would do well in any capacity. Thousands of sailors are Filipinos by heredity, and thousands are anxious to enter the Government service in any capacity. It would be distinctly to their advantage and that of the Government to employ them. Their services can be had for about one-half what we are now paying our transport crews. As they are American subjects, no reasonable objection to their employment can be made by the trades unions of San Francisco or by anyone else. They are sober, industrious, and apt, and would provide all our transports with permanent and reliable crews, which is what they need but can not have under the present plan.

Lieutenant-Colonel Mills (Philippines) says:

The supply works for the transport quartermaster and commissary of subsistence is undoubtedly greater than is necessary. Whether the transports are overmanned I am in doubt. This can only be told by observations at sea when the boat has her full complement of passengers; no amount of inspections in port are satisfactory as regards the workings of a transport. All transports should, I think, be inspected at sea at least once a year. The services of officers [of the Inspector-General's Department] en route to and from the United States could be utilized for this purpose, they being furnished with a carefully drawn letter of instructions.

LAND TRANSPORTATION.

Of the utmost importance to an army in the field are its means of transportation. For active field service a soldier usually carries three days' rations and 100 (formerly 60) rounds of ammunition, but the moment they are exhausted he becomes dependent upon the transportation for replenishment. The sick and wounded have also to be carried both from the field of battle to the hospital and during marches. When the number of animals required for this work is taken into consideration, together with their cost and that of their maintenance and care, the possibilities of mechanical transportation as an important factor toward economy as well as efficiency may be apparent. Moreover, the field for propulsion of wheeled transportation is not limited to the supply wagons and ambulances, but embraces the actual engines of war. The following extract from a recently published letter of one of our foreign consuls shows, briefly, the great interest taken by European governments in this subject from a military standpoint:

Not long since the automobile owners in France received a circular from the artillery station at Vincennes regarding the conditions upon which automobiles could be bought should mobilization become necessary. The minister of war in Germany is having vehicles constructed with tables upon which officers can consult their maps while on the march, and also as ambulances, and to carry guns, ammunition, etc. In the recent German military movements automobiles, motorcycles, and bicycles entirely replaced horses in the service of the general staff. To obviate expense and delay in special construction of railroads for campaign purposes, the ministers of war of Austria-Hungary and of Italy are having automobiles built solely for rapid mobilization. The latter has offered prizes for types fulfilling certain conditions. The secretary of state for war in England has offered prizes amounting to more than \$4,000 for the best self-propelled lorrie or wagon for military purposes.

The great objection to electric motors—that they will not run far enough without recharging—is said to be overcome. It is recorded that recently in England a circuit of 94 miles was run without recharging. It was done with a battery of 42 4-plate cells, with a capacity of 180 ampere-hours. The carriage was a 4-wheeled dogcart, with 2 motors of 2½ horsepower each. The secret of the battery which enabled it to make such a record was that in going downgrade the motors were reversed, thus making dynamos for charging the accumulators. In this way the current was not only saved, but a new current actually generated, rendering the battery stronger at the bottom of the grade than it was at the top. Might not the wasted energy of the automobile as it flies down American hills be utilized?

OPERATIONS OF THE SIGNAL CORPS IN THE PHILIPPINES.

The following interesting extracts are taken from a report of an inspection of the affairs of the Signal Corps, Philippine Islands, made toward the close of the past fiscal year by Col. J. P. Sanger, inspector-general:

* * * Very little need be said of the Signal Corps except by way of commendation. Landing at Cavite August 1, 1898, it established communication with Camp Dewey in front of Manila four days thereafter, and since that time has been continually employed in expanding our system of telegraph lines and cables until they aggregate 5,600 miles in length. The cable ship *Burnside* is now laying additional cable from Jolo to Zamboanga, Zamboanga to Tacuran, Tacuran to ~~Colombo~~ Misamis to Dumaguete, and thence to the island of Cebu; the west coast ~~coast~~ to the island of Masbate, and thence to Donsol, in southern Luzon.

During the past year 2,459 miles of land lines have been constructed and 200 telephone and telegraph offices established, so that there are now in the archipelago 220 telegraph offices and 415 telephone stations, located in 400 different towns, all operated by members of the Signal Corps. In the performance of their duties during the past year 7 men have been killed, 7 have died of disease, 2 have been injured, and 30 invalided home; 56 have been discharged and there has been 1 desertion—a most excellent record.

* * * If the lines are to be maintained by the Government as heretofore, practically without charge to users, the net running expenses will be about the same as last year. On the other hand, a large revenue could be derived by a small assessment, which would not only offset all expenditures, but bring in a handsome revenue. In this connection Colonel Allen says: "An average of 10,000 messages per day are sent, received, and relayed, or about 3,300 messages, averaging 30 words each, are actually filed for transmission; this, at the Government rate of 1 cent per word, would represent earnings amounting to \$1,000 per day, or an average of \$365,000 per year, gold. In addition to this a large number of messages are transmitted by telephone of which no record is kept, the number of calls on the Manila city line alone averaging from 13,000 to 15,000 per month. Of course, while the mail facilities remain as they are, a large amount of official telegraphy is necessary, both civil and military. On the other hand, the lines are constantly used to send personal messages, and for these it would seem there should now be the usual Government charge of 1 cent per word, and that the lines should be thrown open to the public, official messages always to have precedence.

Colonel Allen states that the amount collected from this source in the Visayan Islands during the past year was nearly enough to pay for the maintenance of the lines, outside of the pay of operators, which was provided for by army appropriations. Whether, as has been suggested, the time has arrived for the transfer of the lines to the civil government or other civil corporation is by no means certain. At this juncture they are of such vital importance in the conduct of military affairs as to make military control indispensable, although certain portions might possibly be transferred in that way, provided it could be done so as to obviate mixed or joint control on the part of the military and civil authorities. But before any change of this kind is made, civilian telegraph operators will be necessary, and they will need instruction to prepare them for the work. Colonel Allen estimates that within the next two or three years there will be employment in the telegraph service for a thousand Filipinos, and suggests the necessity for a school in which they can receive instruction for at least a year. As it will be many years before white men can be induced to live in the isolated and remote towns of the archipelago, except at very high pay, it would seem as though Colonel Allen's suggestion should be carried into effect whenever the transfer of control is seriously considered.

MILITARY COLLEGES.

Evidences of the progressive spirit of our institutions of learning during the past year are abundantly illustrated by the stride which has been made in the dissemination of military knowledge through the agency of officers of the Army. At the close of the preceding fiscal year there were but 37 officers reported on duty at universities and colleges as professors of military science and tactics, all of whom were on the retired list. This number was gradually augmented until at the close of the fiscal year ending June 30, 1901, when there was a total of 58 officers reported on such duty, being an increase of some 57 per cent. A brief résumé of the several laws authorizing these details may not be without interest. By the act of July 28, 1866, the President could, upon the application of any established military institute, seminary or academy, college or university within the United States, having capacity to educate, at the same time, not less than 150 male students, detail officers of the Army to the number of 10 to act as professors of military science and tactics. Additional legislation increasing the number was enacted as follows, viz: July 5, 1876, 30 officers; July 5, 1884, 40 officers; September 26, 1888, 50 officers of the Army and 10 of the Navy; January 13, 1891, 75 army officers; November 3, 1893, the number of army officers was increased to 100, with 10 from the Navy, making a total of 110. The act of February 26, 1879, provided as follows:

For the purpose of promoting a knowledge of steam engineering and iron ship-building among the young men of the United States, the President may detail an officer from the Engineer Corps of the Navy as professor of schools and colleges, not exceeding a total of 20 in all.

As an indication of the increasing importance of military instruction at civil institutions of learning and the value placed upon it by Congress, it is proper to note that in the act of November 3, 1893, it was provided that—

No officer shall be thus detailed who has not had five years' service in the Army, and no detail to such duty shall extend to more than four years.

This act also provided for the detail of officers upon the retired list upon their own application.

The practice of confining these details invariably to officers on the retired list does not seem to produce satisfactory results. It is thought that much better results will be obtained when the conditions of the service are such as to warrant it for the former system, of detailing officers on the active list for such duty, to be renewed.

All of the 58 officers reported on college duty are on the retired list, which is not restricted by law as to number. Those upon the active list have not been available for such duty, owing to other important and pressing demands. That the War Department may succeed in granting all college requests for army details, and especially providing each of the 115 institutions having Government arms and equipments with a capable and acceptable military instructor is the sincere wish of all who are interested in the proper military instruction and training of the youths of the country. At some of the large institutions the duties appear to be too heavy for

Military professors.

one officer, as instanced by the following extract from an inspection report:

The number of students in the military department at date of inspection was 477, and for the instruction of this large number the combined efforts of the War Department and the university authorities provided one instructor. One of two alternatives seems to be presented, viz: To reduce the number of students and curtail the scope of instruction, or to provide assistants to the professor of military science and tactics.

Four grades of rank are represented among the military professors, there being 2 colonels, 13 majors, 29 captains, and 14 lieutenants. At a majority of the institutions the military representatives are members of the faculty in full standing, and the college authorities generally give them proper support and encouragement, though in some cases more substantial military benefits would doubtless result from a more liberal consideration of the requirements of the military department without detracting from the efficiency and usefulness of the other departments of study. At one institution having no army detail the inspector states:

As far as instruction extends, the condition generally of the military department is good, and its condition is warranted by the benefits produced, for although the instruction has been very limited, extending only to the elements of infantry drill, it is very satisfactory so far as it has gone. The conditions at the school are favorable for good work, and a suitable army officer, detailed as instructor, could build up a fine military department.

At another institution the inspector states:

The military instructor is a student of the college, as the college was unable to secure the services of an army officer. They earnestly desire to secure a regular officer next season, and are willing to pay him \$1,000 per annum if he will also teach mathematics in addition to the military course. They have no quarters for him on the grounds, however.

Quarters are provided for the military professors at many of the institutions, and their efforts in building up and maintaining the military feature at a high standard are praiseworthy.

The desire of all institutions having an army detail to have the inspections made as near as possible to the close of the scholastic year, which apparently offers the best opportunity for presenting the year's work, operates to prevent a complete inspection of all of them by officers of the Inspector-General's Department, who, on account of their limited number, are unable to reach so many widely separated points within the specified time. Of the 58 institutions having an army detail, 48 were inspected near the close of the college year, and of these inspections 28 were made by officers on duty in this department and 20 by officers specially detailed for the purpose. The Government arms and equipments at 33 additional institutions were inspected, and of these 24 were made by officers on duty in this department and 9 by special inspectors, so that of the 115 institutions having an army detail or Government arms and equipments, or both, 81, or about 70 per cent, were inspected. However, the military departments of a number of institutions having no detail, which were visited for the purpose of inspecting the Government arms and equipments, were also inspected by special request of the college authorities, and the entire corps of cadets were seen in ranks. The visits of inspectors were not in all instances timed as desired or intended, and some unavoidable delays resulted, so that the corps of cadets had been disbanded or materially depleted in number. Thus the record of present in ranks at inspection has been reported from 50 institutions, having a total of 7,391 cadets, or an average of

147 per college. This is a slight improvement over the preceding year, when the average was reported as 140.

Students. Seventy-two colleges report an aggregate capacity of 42,515 students, giving an average of some 590 per college. At several institutions the capacity is said to be unlimited. At 76 colleges the male matriculants averaged 447 per college and numbered in all 33,969, with extreme ranges of 2,720 as a maximum and 33 as a minimum. It is interesting to note that these data are for the same number of colleges reporting last year, when the entrants numbered 30,125, giving an average of 396 per school. The matriculants at 54 colleges numbered 25,789, and of this number 23,093, or about 88 per cent, were reported as being over 14 years of age.

Military department. It is not possible to present complete statistics as to the operations of the military departments, owing to the recent hiatus in army details and the absence of records, but the following information from those from which full reports have been received may be of interest:

The reports show that the enrolled strength of the military departments of 74 colleges foots up a total of 15,272 cadets, or an average of 206 per college, with extremes ranging from 21 to 890. Among them there are 7 having an enrollment of 500 or more cadets, and 6 with an enrollment of from 300 to 500. In each of the others the strength of the military department is less than 300 cadets. The reports indicate that the average strength of the military departments, based upon the figures for 56 colleges, is 194, with a maximum of 750 and a minimum of 17 cadets. The age of these cadets averaged not quite 18 years, and ranged between 14 and 23. Forty-nine colleges report a total of 1,198 graduates from the military departments during the year.

The military organizations of the cadets in the military departments are patterned after those in the Army, the unit being the infantry company. Where there are a sufficient number of companies these are organized into battalions and regiments, with the usual field and staff. There are also a number of detachments reported, such as artillery, cavalry, signal, etc., which are formed for the purpose of instruction in these particular branches, the personnel of which is usually included in the infantry organizations. The following table shows the strength of the military organizations heard from on the day reported. Similar information for the year 1897, when military instruction was in a very flourishing and healthy condition, is also incorporated, together with the data for the year 1900:

Year.	Colleges reporting.	Organizations.			Strength.						
		Regiments.	Battalions.	Companies.	Field and staff.		Line.		Total.	Average per college.	Average per company.
					Officers.	Noncommissioned officers and band.	Officers.	Noncommissioned officers and privates.			
1897.....	101	4	92	301	226	963	896	11,471	13,556	135	45
1900.....	74	5	56	228	207	830	667	9,350	11,064	149	48
1901.....	54	4	49	181	163	608	528	8,044	9,344	173	52

While it is regretted that reports containing these data have not been received from a larger number of colleges during the past

year, an examination of the table shows that the conditions for 1901 are quite satisfactory, and that there has been a decided increase in the average strength of the military department per college, as well as larger average company organizations. As compared with 1897 there has been an increase in the average strength of military departments of 27 per cent, and the companies have been enlarged to the extent of 15½ per cent.

The discipline of the cadets has generally been reported satisfactory, and the interest they manifest in their work is quite commendable and praiseworthy at many of the institutions. A proper incentive for the best efforts appears to be recognized, and may be well illustrated in the remarks of one of the professors of military science and tactics in his annual report, as follows:

The military department is on a very much better footing than it was a year ago, and the students are taking a greater interest in it. If an occasional appointment to the grade of second lieutenant in the Regular Army could be made from the graduating class it would prove a very great incentive for better work, make the military department more popular, besides sending capable young men into the Army. It would be a prize worth striving for and raise the standard of character in the military department. Many worthy young men are ambitious for commissions, but after graduating from college are not disposed to enlist and trust to the uncertainty of obtaining it after a service of two years in the ranks. Too much importance can not be given to this matter. The question is often asked by students, "Of what use is it to become proficient in the military department if we can not get appointments in the Army."

A partial remedy may be within the power of the institutions themselves to grant. For instance, in the report of inspection of one of the larger universities the inspector states that graduated officers are placed on the retired list of the university corps of cadets, and are commissioned by the governor of the State; and they are subject to call into active service as officers of the National Guard of the State. Upon this subject the following remarks of Lieut. Col. Marion P. Maus, inspector-general of volunteers, may not be inappropriate:

It would be to the interest of military efficiency generally for the General Government to make more liberal appropriations to encourage in every possible way military education in all colleges and schools. Cadet corps should be required to go into camp at least for one week during the year, for which purpose tentage, camp and garrison equipage should be supplied, and they required to do, as far as possible, regular field service. Target practice should be held at the same time, and these camps subject to inspection of Regular Army officers. The number of men instructed in this way would be very large, and the extra expense would more than be repaid to the country should the formation of large armies again be necessary.

United and harmonious action on the part of the superior authorities of the National Government and the college authorities may be expected to fully recognize and fairly meet the necessities of these important adjuncts of military education.

Instruction. As a rule, the minimum requirement of two hours a week for practical instruction and one hour a week for theoretical instruction appears to have been observed and generally adhered to.

Very excellent results have been reported in some instances, and a high degree of efficiency attained at many of the colleges. Perhaps an idea of some of the work in the line of drills, in the three arms, and their character as to efficiency can be gleaned from the following extracts of reports of inspecting officers:

After the inspection there was drill in the school of the company, which was very satisfactory, the movements being promptly and correctly performed. This was followed by saber drill, which showed careful instruction; and then an excellent

artillery drill. The rapidity and accuracy in mounting and dismounting and loading and firing the pieces deserves high commendation. The drill, generally, in the service of the piece was in every respect satisfactory.

The battalion was formed in double rank, in full dress, for review and inspection, at 9 o'clock a. m., on the 13th instant, with the major commandant in command. It presented a very fine military appearance. After passing in review, in quick and double time, the battalion was carefully inspected. Alignments, both in line and column, were excellent, and distances very well preserved. * * * Arms were handled with precision and snap. The military bearing of the cadets was excellent, and uniforms were very neat and well-fitting. * * * Guard mounting, as witnessed, was properly performed. * * * The drill embraced nearly all the movements in the drill regulations; they were well executed, with cadence and distances well preserved. * * * I noticed no mistakes worthy of mention. Commands were given with confidence and were promptly executed.

Light artillery drill was performed by two gun detachments. The drill consisted in the manual of the piece, limbering and unlimbering, coming into action in different directions and loading and firing with and without blank cartridges, and with friction primers only. Mechanical maneuvers consisted of dismounting and mounting the piece and carriage and changing the wheels. The artillery drill and maneuvers were excellently performed and with decided snap.

A mounted squad of 16 cadets was formed and gave an exhibition drill in the riding hall.

The movements by file, twos, and fours were excellent, and the rough riding was an astonishing exhibition of skillful, daring, and fearless horsemanship. The mounting and dismounting at a gallop, the riding facing sideways and to the rear, riding double, vaulting over horse and mounting from the off side, riding standing in crossed stirrups, jumping the hurdle, dismounting and mounting at the jump, by twos at a gallop (insideman dismounts, vaults over own horse and mounts the far horse, facing to the rear), low reaching, saber exercise, etc., all were performed with wonderful skill and agility. Had I not seen this riding I could hardly have believed such training possible in a private school where an exacting academic course is pursued.

The practical instruction embraced infantry, cavalry, and artillery drills, competitive, exhibition, and signal drills, dress and street parades, problems in minor tactics, practice marches, encampments, guard mounting, target and gallery practice, etc., and the theoretical instruction was confined generally to lectures and recitations in Drill Regulations and Guard Manual, the elementary principles of the art of war, the organization and administration of the Army, and to instruction in the preparation of company reports and returns. Some statistical data in connection with this and other matters will be found in Appendix B.

Arms and equipments. The small arms in use at colleges consist of the caliber .45 Springfield cadet rifles and accompanying accouterments. Modern arms and equipments should be provided, if practicable, as good implements would doubtless result in improved work, and it is fair to assume that these young men are impressed with the uselessness of out-of-date, antiquated equipments for field service. At many of the colleges the property is reported in fair condition and well cared for. A retired enlisted man has been employed as armorer at several of the institutions, and at these the property was generally found in excellent condition.

INSPECTIONS UNDER ARMY REGULATIONS 967 AND 968.

General remarks. Attention is invited to Appendix D, which gives, in tabular form, the designation and location of the general depots of the Quartermaster's, Subsistence, Medical, and Ordnance departments and the arsenals and general hospitals inspected under A. R. 968, when and by whom inspected, the number of officers, enlisted men, and civilian employees, and the monthly expenditures on

account of civilian employees and labor, the number of patients in the general hospitals, and the number of female nurses; also the amount paid for rent of buildings occupied, as shown by the inspection reports.

During the fiscal year five arsenals were abolished by your direction, and the discontinuance of two general depots of the Quartermaster's Department, one subsistence depot, and one general hospital, which was recommended by officers of this department, was effected. In addition, the very excellent and practical recommendations made June 15, 1901, by Col. J. P. Sanger, Inspector-General, with a view to reducing the expenditures of the Medical Department in the Division of the Philippines, contemplate a reduction of the number of general hospitals in Manila to one or two and a consolidation of the three medical supply depots there into one. These recommendations have received the indorsement of the local military authorities and have been, or will be, carried out.

The foregoing are a few illustrations of what has been accomplished in the way of retrenchment during the year. They are prompt responses to your instructions promulgated in General Orders, No. 61, Headquarters of the Army, May 1, 1901, with a view to the enforcement of rigid economy in the public expenses, and the reduction, wherever possible, of war expenditures to a peace basis, and are indicative of hearty cooperation on the part of all officers concerned.

With the exception of the subsistence depot at Manila, P. I., which, while under charge of a volunteer commissary for a brief period, proved to be the weak link in the chain of administrative and business methods, the affairs of the various general supply depots, arsenals, and general hospitals have been conducted in accordance with law, regulations, and orders, and very generally in such a manner as to reflect credit on the officers in charge, many of whom have been commended by the inspectors for the admirable character of their work.

Attention has again been drawn by inspectors on duty in the Philippines to the fact that boxes of stores are frequently too heavy for shipment over the seas, and often, as a result, arrive at their destination in bad condition, sometimes broken to pieces and giving an opportunity for stealing. It has been suggested that boxes of stores should usually weigh about 100 pounds, and about 300 pounds should be the maximum weight authorized. Officers who had had experience with the allied troops in China report that the British packages averaged about 80 pounds and that the Japanese allow few boxes to exceed 100 pounds, while the American boxes were generally too large and heavy and put up in flimsy cases, often coming to pieces.

The large losses of stores in transit have attracted the attention of inspectors-general during the year, and it is very evident from their reports that there is room for improvement in the system of checking of packages, watching them en route, and responsibility that they reach their destination intact and in good condition.

A special report on the loss of medical supplies made by Col. P. D. Vroom, inspector-general, under date of December 28, 1900, indicates that of 9,923 packages of medical stores turned over to the depot quartermaster at New York City for shipment 147 were apparently lost between the medical supply depot and the transports and 141 between New York City and the Philippines, making a total of 288 packages lost or unaccounted for between the supply depot and the intended destination. And Col. E. A. Garlington, inspector-general, in his

report of inspection of the subsistence depot at Manila, P. I., dated May 23, 1901, gives the value of subsistence stores, based on the invoices, lost or stolen in transit from the United States to that depot between March, 1900, and March, 1901, as \$63,605.51.

The reports of inspection of the quartermaster depots indicate that they are in good working order, and that their affairs are being conducted in accordance with law, regulations, and orders. Public buildings, offices, storehouses, etc., are generally in good repair, and all property appears to be properly protected and well cared for. Remarks of inspectors touching on conditions and special matters at certain depots are, in effect, as follows:

Chickamauga Park, Georgia. No more quartermaster supplies of any description are sent to this depot, and with the shipment of the means of transportation remaining on hand the depot may be discontinued. (The depot has since been discontinued.)

Jeffersonville, Ind. In the main storehouse iron becomes rusty after short storage. An administration building and another storehouse are needed.

New York, N. Y. The total annual rental paid for private buildings and the pier is \$35,770, which the depot quartermaster considers reasonable.

By the act approved March 3, 1901, the sum of \$60,000 was appropriated for the construction of storehouses on Governors Island, N. Y. This is a good beginning and augurs well for a reduction in the near future of the large expenditures now necessary on account of storage facilities, and is a step in the direction of economy.

Philadelphia, Pa. (Schuylkill Arsenal). Additional office room is badly needed for the proper transaction of the business of the depot, and approval of the plans submitted by Captain Williamson for enlargement of the present office building is recommended. A new electric plant has been installed and in operation since August 1, 1900, and authority has been granted for a storage battery, which will be put in position in the near future, and which will, it is thought, result in a saving of about \$2,500 per annum.

St. Asaph, Va. The size of the grounds and accessibility of the place make it very desirable for a depot of its present character. The descriptive lists of the animals have, in many instances, never been received at the depot, and the description appearing on the descriptive book in such cases is one made after the receipt of the animal at the depot. Paragraph 1146, Army Regulations of 1901, directs that a complete descriptive list of each animal will be made at time of purchase, and will accompany him wherever he may be transferred.

San Francisco, Cal. The duties of depot quartermaster and superintendent of transport service are too much for one officer to perform, giving proper attention to the many matters which require the personal supervision of the responsible officer, and it is recommended that one officer be given charge of the transport service and another the depot. The clothing manufactured at the depot has been very satisfactory, and an increase of the factory to meet demands is suggested. Six buildings used for storage purposes are rented at \$2,941.67 per month. Attention is invited to the remarks of the inspector (Lieutenant-Colonel Maus), as follows:

During my inspection I observed that there is a large amount of clothing stored in warehouses Nos. 2 and 5, both on Mission street, much of which has been in store for a long time. It is believed that it would be in the interest of the service to have

portions issued gratuitously to the troops, rather than to be kept much longer in store, as it must continue to deteriorate, while the cost increases, and in the end must be inspected and condemned. Among these articles are 60,000 cork helmets, 109,493 blouses, 134,500 trousers, 119,000 summer coats of drilling and duck; besides, there are 99,000 white duck suits, 123,000 summer trousers, 36,000 canvas fatigue coats, and 25,000 canvas fatigue trousers. This clothing ought to be needed in the Philippine Islands. There is much other clothing. Among other supplies were 4,750 chairs. These were stored in warehouse No. 3. They are put up ready for use, and occupy ten or twelve times as much space as they would if taken apart or knocked down, as is the custom with furniture dealers. It is reported that they were also shipped put together, which adds greatly to the cost of freight and should be forbidden.

The number of storehouses here has largely increased, and still additional store-room is reported necessary. It is believed that there could be a reduction of at least one or two buildings by getting rid of stores which are not necessary to be kept here.

The uncertainty in the past as regards the number of troops necessary in the Philippine Islands has made the estimates of supplies needed uncertain; but as the Army has been brought to a permanent basis, it will be doubtless found that stores can now be shipped directly to the points required and the expense of storage and drayage and in hauling to and from warehouses saved.

Almost all commissary supplies are shipped directly to the transports from dealers, obviating the necessity of storage and consequent expense incident thereto.

These warehouses are located a considerable distance from the transport piers. It would be in the interest of economy and expedite the loading if supplies were stored nearer to the shipping points. The storehouse on Sixth and Townsend streets, used largely for transport property, is especially a very long distance from the wharf, and it must cost largely to have supplies hauled from the wharf to that point.

Buildings such as needed would be constructed near the transport piers if rental were insured, and I am informed that capitalists have made offers to do so.

Attention is again invited to the fact that there are excellent sites on Government land at Angel Island and at the Presidio of San Francisco for storehouses, especially for those needed for ocean transportation. Stores could be landed directly from or loaded on transports, as there is plenty of water at both places. It would, however, be necessary to construct suitable wharves and buildings; but in the end it doubtless would be economy for the Government to do so.

St. Louis (Mo.) clothing depot.

The depot needs an additional storehouse, improvement of Second street in front of clothing depot grounds, paved entrance way, and a system of granitoid walks, and heating of storehouse from an outside steam heating plant.

Washington, D. C.

In view of the great volume of business transacted at this depot, which has recently been augmented by the addition of the St. Asaph depot to the charge of the depot quartermaster, the inspector (Lieutenant-Colonel Heyl) suggests that it would be in the interest of good business administration to assign an assistant to share part of his responsibilities.

Havana, Cuba.

A great deal of labor has been entailed upon this depot by numerous quantities of more or less unserviceable property turned in from time to time by regular and volunteer troops returning from Cuba to the United States. This property has all been thoroughly overhauled and placed, as far as possible, in a serviceable condition, the surplus being shipped back to the United States under instructions from the Quartermaster-General.

The Tricornia Military Railroad, which is connected with this depot, was constructed by the Quartermaster's Department upon the recommendation of the military board of which Col. J. G. C. Lee, Quartermaster's Department, was president and the late Colonel Waring, of New York, adviser on sanitary matters. This board was convened by order of the Secretary of War in the autumn of 1898, preliminary to occupation of Havana and vicinity by United States troops. The

object in building the road was to afford ingress and egress to and from Havana Harbor for troops and supplies in such a manner as to avoid supposed danger of contagion from yellow fever—i. e., by not transporting them through the city of Havana. There is a good wharf at Triscornia, seven large store sheds, and a railroad engine house. The railroad comes to the wharf and runs by the sheds. The road at the present time (June 15, 1901) is in excellent condition and probably could be sold for as much as it cost or more. It is now the property of the insular government. The number of employees connected with the railroad is 12 and their total monthly compensation \$810. There are also at Triscornia 14 employees of the depot, who are included in the statistical table given in Appendix D.

San Juan, P. R.

The number of employees and the means of transportation were excessive, but steps were being taken with a view to their reduction.

Honolulu, H. I.

Forage was reported to be inferior in quality and excessive in price. (Bids opened since date of inspection, April 16, 1901, show a considerable reduction in prices from old contract rates.) Loosely baled hay should not be sent here in the future, on account of the greatly increased cost of transportation. Transport coal is unprotected from the weather. Scales for weighing coal are private property, and it would be in the interest of the Government to purchase them. A reduction in the number of employees could, it is believed, be made without detriment to the service, and the number of animals should be reduced.

Manila, P. I.

Two important changes have been made in this depot during the year, viz: On December 19, 1900, the land transportation, and on April 1, 1901, the water transport became each a separate department. This depot receives all the quartermaster supplies shipped from the United States and distributes them to subdepots and posts. Between July 1, 1900, and April 23, 1901, the tonnage received and shipped amounted to 680,606,000 pounds. The open-market purchases from July 1, 1900, to April 23, 1901, amounted to \$3,966,570.60. These purchases were made to meet immediate requirements of troops, and the prices paid compare favorably with prices of similar articles laid down in Manila from the United States. Storage room is insufficient. Oil, which is stored too near the depot and shops, is to be removed to a more suitable place. Protection against fire is inadequate, and in view of the pressing necessity for protection in case of fire to millions of dollars' worth of Government property, it is suggested that an allotment be made so that the work on the fire boat now being built may be completed as soon as possible. A three-story building has been erected for shops. A great variety of articles are manufactured and repaired at the depot for the transport service and for all branches of the Quartermaster's Department. The shops seem to be properly and efficiently conducted. Requisitions are filled from the United States in from four to six months. In a report dated June 1, 1901, Maj. L. A. Lovering, acting inspector-general, says:

From report of depot quartermaster and from observation it appears that the stores shipped to the Philippines are generally satisfactory. Some khaki fades and there are so many patterns of coats that I have never seen a company with coats all alike. There are some stores on hand, shipped here from China, unsuited to the climate—fur gloves, cape, and Sibley stoves, etc. Stores received are often in large and heavy boxes, unsuitable for ocean shipment. There is generally a surplus of large-sized

clothing. Men here wear the thinnest underclothes, generally loose weight, and do not require so much large-sized clothing. The proportion of sizes in the clothing table does not apply to this climate.

On the subject of native labor and the deterioration of American labor in the Philippines, Major Lovering reports:

The civilian employees are reported as in most instances efficient and capable. Owing to sickness and other causes necessitating changes, the standard of efficiency can not always be maintained.

From observation of laborers at depot and all other government offices, it is noticed that the force is constantly changing. The effect of climate upon the employees, many of whom have served an enlistment in the Philippines, is marked. The capacity for work and ability to resist tropical sickness diminish from month to month. This is particularly noticeable where hard manual labor is required. In many instances I have found officers and civilian superintendents who are satisfied with the native and Chinese labor. That native labor can be utilized under white direction is shown from observation of many industries and government workshops. If this subject was investigated by an expert, it would perhaps be determined to what extent native labor can be economically and satisfactorily taken advantage of.

At Manila everything is lightered to and from ships. Lighterage in Manila Harbor. The Quartermaster's Department is constantly adding to its fleet of lorchas, and it is contemplated to eventually complete it so that there will be no necessity for the use of cascoes, which are all open and give an opportunity for thieving. In the lorchas the cargo can be locked up, thus affording better protection to freight from the ship to the dock. Major Lovering remarks:

The large amount of property received and shipped by water, when considered in connection with the limited facilities and water frontage, would seem to render it advisable to reship direct to steamers the stores for other ports or to have storehouses where there are better facilities for loading and unloading.

For the better care and handling of means of transportation, forage, and fuel, a land transportation department has been in operation at Manila, P. I., since December 19, 1900, as a separate institution of the Quartermaster's Department. The duties assigned to it include the receiving of animals, forage, and fuel and the transferring and issuing of the same to depots and posts. Wagon transportation and pack animals are fitted out and sent to posts, local transportation is furnished to the different departments and transportation is repaired for all commands accessible to Manila. There is a veterinary hospital, with capacity for 110 animals, connected with the department; also a contagious hospital, with capacity for 16 animals. The department was inspected by Maj. L. A. Lovering, acting inspector-general, March 22, 1901, and is reported to be in good condition. Attention is invited to his remarks on the subject of forage, as follows:

The forage (bran, oats, and hay) is received from the United States via New York, Seattle, Portland, Oreg., and San Francisco, Cal. The forage on hand appears to be of good quality. About 25,000,000 pounds of forage are issued, sold, and consumed per quarter. About 20,000 tons of forage are stored in the forage storehouses. About 10,000 tons of hay and oats are piled in yard and covered with paulins. A large amount of this is being shipped to posts for use during the rainy season. The quartermaster reports that he experiences great difficulty in receiving and caring for forage when large amounts, sometimes two or three ship loads, arrived at once. The harbor facilities for loading or unloading stores are not good. The facilities for storing, caring for, and reshipping forage are not good. A fairly regular supply can be taken care of easily as it arrives and with less chance of loss to the Government. Concerted action between the United States and Manila is recommended in regard to shipment of forage.

Quartermaster's depot, Department of Northern Luzon. This depot was, at the time of inspection, June 20, 1901, being transferred to the general depot of the division.

Subsistence depots. The subsistence depots are reported to be in good condition and their affairs properly conducted, with perhaps a single exception, which will be referred to later on. The buildings are in good repair, suitable, and desirably located, and the supplies on hand are properly stored and well cared for. Purchases are made in accordance with law and regulations and, as far as practicable, directly from first hands. The following items of special interest are reported:

Subsistence depot, San Francisco, Cal. Components of the bread and fruit ration and canned fruits are more reasonable in price here than in any other part of the United States.

Subsistence depot, San Juan, P. R. In addition to the regular work of the depot, large quantities of supplies were distributed to the people of Porto Rico after the hurricane of August, 1899, the money value of which was \$823,027.67.

Subsistence depot at Honolulu, H. I. Building rented at \$150 per month. Inspector (Lieutenant-Colonel Maus) believes that with some changes and repairing of buildings on the barrack lot suitable accommodations for the subsistence depot could be prepared and the monthly rental saved.

Depot commissary, Manila, P. I. This depot receives and ships all the subsistence stores and property intended for the use of the army in the Philippines. About 16,000,000 pounds of stores are received and 14,000,000 shipped per month. The warehouses are the best available. Cold-storage warehouse is conveniently located. The Government owns machinery, but leases the premises on a verbal lease which should be reduced to writing. An additional cold-storage room is also rented. At time of inspection there were piled in the open over \$1,500,000 worth of subsistence stores, but the inspector (Colonel Garlington) reports that an assignment of additional storage room made during the inspection will enable the commissary to put all the stores under cover. It appears that the question of proper storage room has always materially interfered with a business-like administration of the affairs of this depot. The difficulty was unavoidable. The matter of a permanent depot, conveniently located, should be taken up as soon as practicable.

That the affairs of the depot were not properly conducted under the administration of Capt. J. C. Read, assistant commissary of subsistence, United States Volunteers, who had charge from December 1, 1900, to March 31, 1901, is evidenced by the fact that this officer has been dismissed the service and sentenced to three years' confinement in a penitentiary for wrongdoing connected with his duties as depot commissary. Three commissary-sergeants have been tried and convicted for complicity in theft from the depot, and at time of inspection two commissary-sergeants were under arrest for similar offenses. One civilian clerk has also been convicted and sentenced to five years in the penitentiary. The inspector recommended the discharge of the acting chief clerk for manufacturing a fictitious voucher for emergency labor and he has been discharged. When Maj. B. K. West, Subsistence Department (the present depot commissary), relieved Captain Read, an inventory of the stores developed an excess in certain stores

over responsibility of \$35,365.85, and a deficiency in other stores of \$19,466.45. Between March 23, 1901, and May 6, 1901, the value of subsistence stores seized by secret police in bakeries, etc., and turned into the depot was \$2,853.65. Under the administration of Major West the system of receiving stores is working well, and the affairs of the depot are improving every day.

Depot is well located and fairly well adapted.
Sales commissary,
 Manila, P. I. Sales are made to that part of the army stationed in

Manila, P. I., and such civilians as have proper authority to purchase. Probably 7,000 people have the privilege of the depot. All civilians, except the members and attachés of the civil service commission, pay the 10 per centum required by regulations. Rules of identification are prescribed for persons authorized to purchase at the depot and are enforced. Precautions against abuse of the commissary privilege consist in limiting the purchases by persons messing at boarding houses or at public messes to \$25 for an officer and \$10 for a civilian per month. Fresh meats from Australia are reported to be of excellent quality. Percentage of loss of fresh vegetables received, 21.15. An examination of the scales by the inspector developed the fact that they did not balance. System in vogue of carrying a large amount of cash on hand and turning over cash to civilian employees criticised by inspector, who recommended the discharge of the chief clerk for attempting a deception during the official investigation of his accounts, and which was done. The officer in charge did not appear to the inspector to give that close personal attention to and supervision of the details of his business as is necessary to secure the best administration, and, acting on the inspector's report, the division commander directed a very much closer attention to their duties and strict compliance with all orders and regulations on the part of the officer in charge and his assistants. In justice to the officer in charge it is proper to add that the division chief commissary reports that he visited the depot on an average of three times a week for seven months, and that all its features have improved since this officer assumed charge.

The business of this depot appears to be well organized with a view to conducting the work required with
Depot commissary,
 Department Southern
 Luzon, P. I.

dispatch and accuracy. The officer in charge reported that he had experienced continued difficulties with the loading of supplies on boats for southern ports on account of the manner in which the water transportation was managed by the Quartermaster's Department. Subsequent correspondence shows that the difficulties complained of have since been removed.

In excellent condition throughout. In his annual report, dated June 30, 1901, Lieut. Col. P. W. West, inspector-general, suggests that this depot be abolished. His remarks are as follows:

The commissary depot was established at a time when matters were very much congested in the division depot, but that time has passed and it does not seem expedient to maintain this expensive depot within a stone's throw of the main depot, and thus necessitate the double handling and double invoicing of the enormous quantity of supplies furnished by this department. The abolishing of this depot would of course increase the work of the main depot, but this increased work could be performed by about half as many men as are now employed in the department depot. This would mean quite a saving, and I believe the troops would be as well and as promptly supplied as under the present system. (This depot has since been discontinued.)

The building is new and well adapted to the purpose and desirably located for the shipment of supplies by water to the various stations in the Department of the Visayas. Fresh meat is furnished by contract and is reported to be somewhat stringy on account of having to be used too soon after being slaughtered. The depot needs cold storage and refrigerated beef.

Maintained for the benefit of the United States Navy and Marine Corps. Rent of building is paid by the latter.

The reports show that these establishments are in their customary excellent condition, and that all their affairs are being legally and properly administered. With the exception of a quantity of quinine purchased from Messrs. Worden & Co., San Francisco, Cal., and returned to that firm from Manila, under instructions from Washington, the medical supplies have been of good quality.

The means for protection against fire at the general depot, Manila, were reported to be inadequate, and the buildings of the depot for the Department of Northern Luzon were much crowded and considerable property was under tentage. The depot at San Francisco was moved to its present location in June, 1900, on recommendation made by the inspector (Lieutenant-Colonel Maus) at the preceding inspection, the change giving it a decided advantage in the proper transaction of all business. Surgeon in charge states that the storage room is insufficient, and recommends that the two upper floors of the building be turned over by the Quartermaster's Department for use of the depot. In view of the extensive amount of business conducted there and the necessity for a large supply of medical stores being kept on hand for foreign and home demands, the inspector concurs in this recommendation. The advantages of this depot for the purchase of certain classes of medical supplies are understood and utilized.

These institutions are invariably reported to be in excellent condition—as a rule reflecting credit on the surgeons in charge, who have, very generally, been commended by the inspectors. In administration, instruction of the hospital corps, and care and use of public property, medicines, etc., the law, regulations and orders, with very few exceptions, appear to be complied with. The sick are properly cared for, their treatment and general comfort being excellent throughout. Supplies are of good quality and ample. The number of patients in the 14 general hospitals at time of inspection was 1,967, and there were on duty or assigned to these hospitals 61 medical officers, 950 enlisted men, 146 female nurses and matrons, and 186 civilian employes (including oriental labor), making an average of about 13 persons to 19 patients. The total bed capacity is 3,869.

The special needs of particular hospitals, together with other matters of importance, improvements, etc., as shown by the reports are, in brief, as follows:

The surgeon reported that the number of hospital corps men was not sufficient for the needs of the hospital. Hospital corps detachment had not been instructed in first aid and litter drill. Improvements and repairs done during the year represent a great amount of work and thoughtful purpose and planning. Since last annual inspection the sewerage system has been entirely rebuilt and water system improved; officers' quar-

ters have been thoroughly overhauled and repaired and some worthless buildings torn down, and extensive improvements have been made in the hospital buildings. The inspector recommends the installation of an electric plant; also the construction of a septic tank at the point where the sewer discharges into an arroyo leading to the neighboring hamlet of Central. He further recommends that in view of the distance (9 miles) to the nearest market, a good four-mule team with two wheelers for heavier work (six in all) be added to the present means of transportation. Attention is invited to the following remarks of the inspector:

In view of the necessary isolation of the patients at this institution from the outside world, it would seem to be a humane and justifiable expenditure to increase the library, build a good chapel, provide a number of billiard and pool tables, etc., and a band of twenty or twenty-five pieces. The present library is small and has a single small porch or veranda, a small room is set apart in one of the buildings for chapel purposes, and religious services are conducted by the Rev. Mr. Ruffner, of the Episcopal Church. Two billiard tables are owned by some of the patients and a small charge is made for playing. The surgeon's report shows that patients suffer considerably from nostalgia. It is believed that better facilities for recreation, a few additional mules for driving patients about, the sustaining influences of religious services in a well-appointed chapel, and a good band of music, giving daily open-air concerts, would relieve the tedium of existence here, and would be a great aid in the treatment of these unfortunate men.

General hospital,
Presidio of San Francisco,
Cal.

An ice and refrigerating plant, heating plant, and properly equipped laundry have been completed and put in operation, and the grounds have been considerably beautified and improved. Water pressure is not sufficient for fire purposes.

General hospital,
Honolulu, H. I.

The sick from the transports, as well as from the post (Camp McKinley), are treated at this hospital. There is no operating room or laboratory. The inspector (Lieutenant-Colonel Maus) remarks:

I was impressed with the fact that there were no suitable accommodations at the quarantine station for the care of sick with contagious diseases arriving on transports, nor was there any isolation camp where troops could be landed in case it should be necessary for the preservation of those not affected. Some arrangement should be made to provide for such emergencies.

The construction of a suitable hospital on Government land ought to be directed without delay. The present hospital is unsuitable, besides its location is objectionable to certain residents in the vicinity, and the land, although rented at a high rate, may not be secured after the present lease expires.

Second Reserve Hospital,
Manila, P. I.

At time of inspection there were about 28 patients to a nurse and 15 patients to an attendant. The following is a list of the various diets served in this hospital:

Liquid diet.—Beef broth, clam broth, mutton broth, oyster broth, gruels, tea, coffee, gelatin, fresh milk, malted milk.

Special diet.—Fresh fish, codfish, mackerel, mutton, beef, chicken, chipped beef, salmon, oysters, macaroni, tapioca, rice, dried apples, dried peaches, dried apricots, canned fruit when issued.

Light diet.—Mutton broth, beef soup, clam broth, oyster soup, scalloped oysters, stewed oysters, shredded codfish, boiled eggs, germia, farina, rolled oats, butter, corn-starch pudding, custard pudding, bread pudding, tapioca pudding, rice pudding, tea, toast, coffee, crackers, ginger snaps.

Full diet.—Roast beef, beefsteak, mutton stew, boiled beef, beef stew, salmon croquettes, beef hash, hamburger steak, roast mutton, mutton chops, beef potpie, fried bacon, canned corned beef, boiled mutton, stewed codfish, boiled ham, canned salmon, fried ham, roast turkey, baked potatoes, stewed succotash, fried onions, stewed peas, stewed tomatoes, creamed asparagus, fried potatoes, mashed potatoes,

macaroni cheese, stewed corn, rice pudding, French toast, tapioca pudding, apple sauce, cornstarch pudding, stewed peaches, stewed apples, stewed prunes.

In addition to the foregoing, toast, milk toast, soft-boiled eggs, and eggnogs may be given by ward surgeons to selected patients on "liquid" or "light" diets.

Convalescent Hospital, Corregidor Island, P. I. Baths and sinks, which were in tents at last annual inspection, have been put in buildings. This hospital is very pleasantly located on Corregidor Island, and during the hot season there is nearly always a breeze which makes the heat less annoying.

Hospital No. 3, Manila, P. I. This hospital is conducted entirely without civilian assistance. Means for protection against fire are inadequate, and a wash room where patients can wash their hands and faces is needed. Inspector suggests advisability of isolating patients having tuberculosis, who are now in a ward with other patients.

Emergency Hospital, Manila, P. I. This institution is maintained for the purpose of receiving sick soldiers arriving by boat and rail and caring for them until transferred to regular hospitals, caring for all army casualties and emergency cases, and treating Government employees in its vicinity. The hospital is entirely under canvas, which is old and worn, and, in the opinion of the inspector, should be replaced before the rainy season begins. From October 4, 1900, to May 21, 1901, 1,565 patients were treated and returned to duty, and 826 were transferred to regular hospitals. There were no patients at time of inspection.

Santa Mesa Hospital, Manila, P. I. Buildings are of nipa, and are perfectly ventilated, light, pleasant, and comparatively cool. Bamboo floors are wearing out and should be replaced.

Military hospital, Dagupan, P. I. Building, which was formerly a college, is large, and the wards are pleasant and well ventilated. There are no bathing facilities and the water supply is limited, but was being improved. Ice machine was out of order at time of inspection and Australian fresh milk was reported to have deteriorated and spoiled for lack of ice. Supplementary report shows that the ice machine was being repaired by a skilled mechanic. Water is boiled for drinking purposes; a distilling plant would be a great improvement. In regard to the care and treatment of patients the inspector (Major Lovering) remarks:

The patients were notified that I would revisit the wards and listen to any complaints that they desired to make. I spent several hours in the wards unaccompanied by any representative of the hospital. I received no complaints regarding food or treatment received from attendants, nurses, and surgeons. Some of the patients spoke in high terms of the care and attention bestowed upon them in the hospital. They seemed to be contented, and, with some exceptions, cheerful. Some, in fact over twenty, who were not cheerful and hopeful are all men who have been in this or regimental and post hospitals for periods varying from three months to six months, or even longer.

The chief surgeon, Department of Northern Luzon, has a free hand in transferring patients from this hospital whenever it may seem advisable to do so.

Military hospital, Iloilo, P. I. This hospital is used for the sick of troops stationed in and near Iloilo, and the most serious cases from other points in Panay and Negros are sent to it for treatment or for transfer to Manila. Several improvements are noted, among them a new building which was almost ready for occupancy at time

of inspection. The inspector (Captain Bundy) makes the following suggestions:

The brassards now supplied should be improved. They look well when new, but they do not wash well. The red of the cross fades and the color runs into white. The cross should be of fast color, and perhaps the brassard would be better for Philippine service if made of cotton drilling or other material than flannel. It is also suggested that the cross on the hospital ambulance be made a more prominent feature, so as to be more readily seen. While this is not an important consideration in Philippine service, perhaps it might be elsewhere.

This hospital was opened February 7, 1901, from which date to date of inspection (April 21, 1901) only two patients were admitted. Inspector (Lieutenant-Colonel Mills) recommended that the hospital be closed and the personnel and stores returned to Manila. (Hospital has since been discontinued.)

Retrenchments.

The following remarks and recommendations by Col. J. P. Sanger, inspector-general, in his report dated June 15, 1901, on the subject of reduction of expenses of the Medical Department in the Philippines, are in line with your instructions published in General Orders, No. 61, Headquarters of the Army, May 1, 1901, with a view to retrenchment and rigid economy promptly following the disappearance of active military operations, which always tend toward habits of expense not justified in time of peace:

With a view to a more perfect supervision over this subject in future, I beg leave to offer the following recommendations bearing directly on it, and suggested by this inspection.

First. That a board of medical officers be convened to examine into the subject of expenditures with a view to their more perfect regulation, as I am satisfied that a considerable reduction in the allowance of the Philippine supply table can be made, except in stimulants and the drugs and medicines prescribed for intestinal and skin diseases and fevers.

The officers now in charge of the depots in Manila are thoroughly conversant with the subject and would no doubt discharge this important duty to the satisfaction of the Surgeon-General. These officers are Maj. Louis T. Crampton, Maj. M. C. Ireland, and Maj. P. C. Fauntleroy. I may say that the medical depot of this division is a model of its kind and that Major Ireland, in charge, deserves special commendation for his careful administration. I have but one suggestion to offer in regard to the arrangement of the supplies, and that is that all volatile and highly inflammable liquids be segregated and placed in the brick warehouse and not stored with other supplies, so as to reduce to a minimum the disastrous results of a conflagration, should one occur. I believe that it is Major Ireland's intention to do this, and it should be done at all depots.

Second. Another important measure, and one which will greatly promote the control of medical expenditures, is the maintenance of stock books, in which shall be kept an account of all receipts and issues, to be balanced every week or ten days and to be one of the permanent records of the depot and of every hospital.

As before stated, officers who are responsible for medical stores invariably carry off all returns, etc., which cover their period of accountability, and as the requisitions are often lost or imperfect in form, it is impossible to reach correct conclusions in respect to expenditures extending beyond the time of the incumbent officer.

* * * * *

Third. All drugs and medicines shipped to the Philippines should be in boxes or packages, not to exceed 100 pounds in weight, for facility in loading into native boats and for transportation in native carts, and all boxes should be wired or securely strapped, so they can not be opened en route without showing evidence of it; nor should drugs, medicines, or articles of different kinds be packed in the same box, as this requires rearrangement of the contents before issues can be made and involves a needless amount of work.

Fourth. I also venture to suggest that, as all property returns en route from posts in the Philippines to Washington must go to Manila, they be sent through the office of the chief surgeon, to enable him to examine them, or, if this is not thought advisable, that he be furnished with a copy of the return by the officer who makes it, so that he may better supervise expenditures and the distribution of supplies.

Fifth. As already stated, there are three medical depots in Manila, one for the division and one for each of the departments of Luzon. This arrangement was considered necessary during active military operations, but it does not seem to be now. The three depots are located side by side in rear of the First Reserve Hospital, on the bank of the Pasig River, and as a measure of economy I recommend that the depots of these two departments be gradually absorbed by the division depot and cease entirely as soon as the supplies now in stock are distributed. This will not only simplify issues but reduce expenses and release for other duty 2 medical officers, 3 hospital stewards, 2 acting hospital stewards, 10 Hospital Corps privates, and 14 laborers.

The next point to which my attention has been attracted is the congested condition of medical affairs in Manila, and the large number of medical officers, hospital stewards, and other Hospital Corps men who are engaged in purely administrative work, requiring no knowledge of the practice of medicine or surgery and but little technical knowledge of any kind. This criticism can be applied to all geographical departments and districts throughout these islands, although in less degree. Of course the administrative duties of the Medical Department must be performed, and preferably by officers of the Medical Department, but where the demand for medical attendance (physicians and surgeons) is as great as it has been and still is throughout this division, it would seem that the complete separation which exists between the two kinds of duty (medicine and administration) should be terminated, and that all medical officers, hospital stewards, and acting hospital stewards should devote a certain portion of their time to the care of the sick and wounded. From this requirement the chief surgeon of the division and his assistants should be exempted, of course, but as a rule no other medical officer or steward. If the supply of medical officers and Hospital Corps men were unlimited, the practice of exempting so many of them from their technical duties might be defended, although I do not believe it is or would be of benefit to the reputation of the Medical Department, under any circumstances, to have so many of its officers in evidence who rarely come into professional contact with the sick.

In the city of Manila, at Corregidor Island, which is in the harbor, and on board the *Relief*, which is usually here, there are at this time, exclusive of the personnel of the chief surgeon's office, and of those en route to and from the United States, * * * 56 medical officers, 34 hospital stewards, 62 acting hospital stewards, 527 privates, 75 nurses, 4 clerks, and 67 laborers, and about 1,122 sick.

Of course this large aggregate of officers and men is chiefly due to the maintenance of the *Relief* and seven hospitals, which were no doubt needed as established, but are not now.

The future garrison of Manila will be, it is said, about one regiment. I am under the impression, therefore, that 500 beds, preferably in a single hospital, for the reception of patients going to the States, the sick of the garrison, and to meet emergencies (in place of the 7 hospitals now maintained), 15 medical officers, with a proportionate number of hospital stewards and privates, will be sufficient for the sick, for the service of supply in Manila, and for special duty. But of course this number will not be sufficient if all medical officers and enlisted men who have administrative duties to perform are thereby relieved from attendance on the sick. The First Reserve Hospital, being adjacent to the medical depot and near the river, is better adapted for the hospital service required than any other in Manila, and if slightly enlarged, the insane removed, and the kitchen put in order will answer very well.

Whether the convalescent hospital at Corregidor Island should be continued, in addition to the one recommended for the city, is a question on which I do not care to express an opinion. If it is retained, then two or three more medical officers will be needed.

Arsenals and ordnance depots. The reports show the condition of the arsenals, ordnance depots, and powder depots to be excellent, and the military and business administration and methods above criticism. The ordnance detachments are properly instructed and efficient and are kept under proper discipline. The messing is excellent and medical attendance satisfactory. Public buildings are generally in good condition and all public property is well protected and cared for. At most of the permanent arsenals and depots various improvements have been noted on the lines of progress and economy. At Rock Island Arsenal electricity has been substituted for the old motive power system, and is reported to be very satisfactory and less

expensive, and, at time of inspection, machinery for the manufacture of small arms was being installed in three shops; at the San Antonio Arsenal a new dynamo has been put in and a new sewerage system constructed; at the Watertown Arsenal a new office building has been completed, and enlargement of the shop capacity at the Springfield Armory is contemplated. Among the improvements reported at the ordnance depot, Manila, P. I., are power plant improved, additional shop machinery put in, sewerage system improved, barrack repaired, and new baths, etc., put in, and, at time of inspection, a new retinning plant was being installed and a gun shed was in course of construction. A suitable building for hospital purposes is needed at the Rock Island Arsenal to replace the old frame hospital, which is reported to be unfit for the purpose and not worth repairing.

San Antonio Arsenal. This arsenal is reported to be insufficiently lighted, and the inspector (Captain Sibley) recommends the installation of an electric plant of sufficient capacity to supply power and light for the arsenal, Fort Sam Houston, and headquarters Department of Texas. He believes that an expenditure of \$25,000 will cover the cost of machinery, material, and installation, and that the change suggested would result in a saving to the Government. It is reported that it would be dangerous to fill the main storehouse at this arsenal to its entire capacity on account of the settling of the foundation and consequent cracking of the walls. Some of the old buildings are in bad condition, and new iron fences are needed to replace the north and south boundary fences, which are reported to be in bad condition. This arsenal is referred to by the inspector as follows:

The natural advantages of location and favorable climatic conditions of San Antonio would make an enlargement of this arsenal a profitable investment for the Government. Especially for the manufacture and storage of leather equipments the conditions appear especially good. Recently, upon tearing up the flooring of the old carpenter shop, formerly used as a storehouse, a strap was found under the floor which has undoubtedly been there many years, probably since the erection of the building, some twenty years since. The leather strap when found was in an almost perfect state of preservation, the leather being still soft and pliable.

Benicia Arsenal, Cal. There seems to be comparatively but little work done at this arsenal, and the inspector (Lieutenant-Colonel Maus) suggests that more be given it. His remarks are as follows:

There is good motive power and considerable good machinery, and it would seem that more work might be done here to the interest of the Government. The buildings are in very good condition.

It is stated that materials and labor are too high on the Pacific coast to have manufacturing done to advantage. However, after careful consideration I am impressed with the fact that during the entire year laborers can work to advantage in this climate, and the consequent average increased amount of work for the same day's labor will make up for the increase in cost of same.

There are several tanneries at Benicia from which good leather is obtained, suitable for the manufacture of equipments. I am informed that some of this leather is of very excellent quality, is shipped East, and commands a high price.

There is a factory here where wagons, agricultural implements, and other articles are produced in successful competition with the Eastern manufactures. If the demand were greater, I am informed by those who should know that the manufacture would be extended to meet the demand. A number of the wagons purchased by the Government are manufactured here.

Such work as retinning and redying of equipments could also be done at the arsenal to advantage. Worn meat-ration cans, tin cups, and other equipments could be renewed in this way.

It is believed that cartridges can be manufactured at the arsenal to advantage. They would be fresh and produced as required, especially for use in the Orient. Powder is manufactured in California, from which a large supply of our small-arms

ammunition is made. Other powders and high explosives are also manufactured here. Lead can be procured, and the production of shot is a great industry. The cost of freight for materials for cartridge cases, to be imported from the East, would be inconsiderable.

It is possible for a condition to arise in a country like ours, where distances are so great, when it would be extremely desirable, if not necessary, to have a manufactory of small-arms ammunition on the Pacific coast, and especially should a war arise with a great power, in which the demand might be urgent and the production over-taxed.

United States powder depot, Dover, N. J. Attention is invited to the following remarks of the inspector (Major Davis):

It is noted that but two men are carried on the rolls as watchmen, and in view of the nature of the materials stored at the depot, the desirability of an ordnance detachment being stationed there to perform necessary guard duty is suggested for the consideration of the proper authorities.

Several improvements have been made during the year, among which are the following: At the proof battery, new field and siege platforms have been installed; a humidity-test building and a building containing a vibrating machine have been designed and erected; concrete gun skids capped with rails have been erected for storing rifles and mortars; water pipes have been run from the main system to the proof battery, involving laying 1,200 feet of pipe; grounds have been graded and grassed and young trees planted; heating system improved; three buildings have been torn down and reerected or built anew at the new proof battery; a new locomotive and cars have been purchased, etc. Inspector (Major Davis) recommends that the present quarters of the ordnance detachment, which are old wooden barracks and badly adapted to the purpose, be fitted up for occupation by such civilian employees as, for the best interests of the service, have to live at the proving ground, and that a new barrack be built for the ordnance detachment.

Arsenals abolished. Under section 1666, Revised Statutes, which authorizes the Secretary of War to abolish such arsenals as, in his judgment, may be useless or unnecessary, the following arsenals were abolished on May 1, 1901, viz: Kennebec Arsenal, Augusta, Me.; Fort Monroe Arsenal, Va.; Allegheny Arsenal, Pa.; Indianapolis Arsenal, Ind., and Columbia Arsenal, Tenn.

United States engineer depot, Fort Totten, N. Y. Inspected November 17, 1900, by Maj. J. M. K. Davis, acting inspector-general. The administrative work is performed by the commanding officer, with the assistance of one enlisted man and two civilian clerks, who receive \$180 monthly pay. All work of receiving, packing, shipping, and caring for stores is performed by enlisted men of the battalion of engineers, who receive in extra pay about \$2,200 per annum. One civilian mechanic is employed, at \$85 per month. The following extract from the inspector's report is indicative of the work performed at the depot and the dispatch with which business is transacted:

During the past year and a half two engineer companies going to Manila were fitted out with tools and supplies, and two divisions of advance-guard bridge trains and a large shipment of tools and materials have been sent to the chief engineer officer at Manila. A large requisition, involving an expenditure of nearly \$100,000, was, with the exception of pile drivers (which had to be made), put well under way within one week of the receipt of the necessary orders.

This depot was established at the close of the War of the Rebellion and much of the old pontoon train of that war is still there. To this has been added siege, reserve, and advance-guard trains. There are

an abundance of tools for several thousand men, much material for siege work, instruments for astronomical and geodetic work, and large supplies for submarine mining. The affairs of the depot appear to be properly conducted.

Recruiting. The recruiting rendezvous at Fort Slocum, N. Y., Columbus Barracks, Ohio, Fort Sheridan, Ill., and Jefferson Barracks, Mo., were each inspected in conjunction with the inspection of the military posts at which they are located. At Fort Slocum, N. Y., the inspector reports a permanent party of 15 men, 7 of whom were on post duty and 8 on duty with recruits. Two of the latter number are designated as drill masters, and in this connection the inspector states:

The labor of converting raw men into soldiers is very great and most important. The future of all recruits is influenced by their first instruction, and the number of drill masters at this rendezvous is sadly deficient. In the opinion of the inspector, too many of the permanent party are employed on post duty, and the permanent party should be increased to 30 men. A few old soldiers are received among the recruits, and such as are fit are employed as drill masters.

At Columbus Barracks, Ohio, there were 580 Philippine recruits, who were organized into four companies. There were 13 commissioned officers and 10 noncommissioned officers reported on duty with the four companies. Touching the matter of clothing for the Philippine recruits, the inspector states:

Each man has a complete suit of blue clothing, together with the necessary under-clothing, and in addition there has been issued and fitted to every man a complete outfit of light clothing, shoes, and leggings for service in the Tropics. This clothing is properly marked with name of soldier and boxed for shipment to accompany the men when they leave the rendezvous en route to the Philippines, and is not to be issued until necessary after reaching the warmer latitudes.

The reports indicate that at date of inspection there were at the four rendezvous a total of 880 general-service recruits. The number of such recruits received from stations during the year is reported as follows, viz: Fort Slocum, N. Y., 3,500 (estimated); Columbus Barracks, Ohio, 1,514; Jefferson Barracks, Mo., 580; Fort Sheridan, Ill., 305.

About 85 per cent of the general recruiting stations, including sub-stations, were inspected during the year by officers on duty in this department. There were on duty at the stations from which reports have been received a total of 58 officers, consisting of 1 lieutenant-colonel, 9 majors, 32 captains, and 16 lieutenants, and divided among the three arms as follows, viz: Cavalry, 10; artillery, 10; and infantry, 38. The reports indicate that the officers in charge have performed their duties with zeal and energy, and a number of them exercise a general supervision over auxiliary or branch stations. The duties of a recruiting officer could doubtless be satisfactorily discharged by officers on the retired list, some of whom, if the law allowed it, might be detailed for the work, and thus leave active officers for other much-needed duty. With a few exceptions the recruiting details are reported competent and satisfactory.

The reports from 66 stations show that a total of 229 rooms are occupied, with monthly rental charges aggregating \$3,154.33, or \$37,851.96 per annum. This indicates that there is paid for each room an average of \$13.77 per month. This is a slight increase over last year, when the average cost of rent per room per month was reported as \$10.65. The rooms per station range in number from 1 to 11, which gives a general average of about 4½ per station. Of 61 stations, the location is reported satisfactory at 55 and not satisfactory at 6. The

bedding and bunks are reported in good condition and the bathing facilities generally ample. Recruiting parties are messed under contract. The minimum cost of one meal is reported as 14½ cents, and the maximum as 35 cents. The food is habitually reported of good quality and sufficient in quantity, and, so far as reported, a record of messing is kept.

As to productiveness, the reports of 67 stations show a total of 69,360 applications, and of this number 16,243 were accepted and 53,117 rejected. This gives a ratio of more than three rejections to one accepted recruit. Last year for every applicant accepted a little less than three were rejected. So the increased rejections may be accepted as an indication of the exercise of the utmost watchfulness on the part of recruiting officers and an improved class of recruits as compared with the previous year, when the demand for men was somewhat more pressing.

At four of these stations 50 per cent or more of the applicants were accepted. These were Dayton, Ohio, Des Moines, Iowa, Dallas, Tex., and Little Rock, Ark. At all other stations 50 per cent or more of the applicants were rejected. The usual causes of rejection, consisting of minors, under size, impaired vision, intemperance, general unfitness, defective teeth, defective chest, defective spine, defective hearing, heart trouble, poor physique, eczema, under height, under weight, imperfect knowledge of English, over age, varicose veins, varicocele, rupture, married, unable to furnish reference, flat feet and hammer toes, aliens, and illiteracy have been reported. Of the accepted recruits the reports indicate that about 85 per cent were native and 15 per cent foreign born, which gives a ratio of native to foreign born recruits of 5.6 to 1. As compared with the preceding year, these figures indicate a slight increase in native recruits. The foreign-born recruits come from Canada, England, Ireland, Scotland, Germany, France, Switzerland, Australia, Norway, Sweden, Italy, Greece, Turkey, Austria, Russia, Denmark, and Bohemia. Of the foregoing countries, three-fourths of all the foreign-born recruits are credited to Ireland, Germany, and England, and of these three nationalities Irish and German are reported in almost equal numbers, with about half as many English. Of 11,879 accepted recruits, 1,960 were reported as minors, 8,879 between 21 and 30, 1,015 between 30 and 40, and 25 over 40 years of age. Among some of the occupations represented by accepted recruits are the following, in the order of predominance, viz: Laborers, farmers, soldiers, clerks, machinists, painters, carpenters, printers, shoemakers, cooks, blacksmiths, barbers, bakers, tailors, engineers, cigar makers, druggists, and dentists.

The recommendation of Lieut. Col. C. H. Heyl, National cemeteries, inspector-general, in his report of inspection of the national cemetery, Arlington, Va.,

That a list of the known dead in this and the various national cemeteries be catalogued in alphabetical order and printed in pamphlet form as a War Department document for circulation,

evidently merits favorable consideration, as this information in a compact and convenient form would meet a long-felt want.

Lieut. Col. Philip Reade, inspector-general of volunteers, in reference to the Custer Battlefield National Cemetery, states—

That authority be granted to plow, manure, harrow, and seed the inclosure not occupied by graves, and that a water plant be established, to cost about \$3,500, to pump water from the Little Big Horn River and thus water the inclosure.

It is also recommended that the place where General Custer fell be marked with a soft iron—malleable, hence nonbreakable—post, with suitable inscription. This spot has never been marked, although it was erroneously reported to have been formerly marked by a marble stone, the last vestige of which is erroneously reported to have been carried away six or seven years ago by relic hunters.

Fifty-eight per cent of the national cemeteries were inspected during the fiscal year ended June 30, 1901, under the biennial system of inspections as prescribed in A. R. 967. There are four grades of pay for superintendents, as follows: \$720, \$780, \$840, and \$900 per annum. Of 39 superintendents, the reports show that 13 receive \$75, 12 receive \$70, 6 receive \$65, and 8 receive the minimum rate of \$60 per month. They are generally reported efficient and of good habits, and the excellent appearance of many of the cemeteries, lodges, grounds, etc., is an indication of the painstaking care and attention bestowed by the superintendents. The amount of funds allowed for the hire of labor in the care of the grounds is reported inadequate in some instances, and in others a higher rate of pay for labor is desired.

The inclosures are generally reported in good condition. They consist of stone walls, brick walls, wire fence, iron fence, picket fence, and hedge. With a few exceptions, the graves are reported as receiving proper care and are in good condition. The national cemetery, Arlington, Va., is said to contain room for 150,000 more graves. Some of the headstones are reported in need of cleaning and some are out of line; with these exceptions, their care and condition are reported as satisfactory. Arlington, Va., and Hampton, Va., are reported as having the highest annual rate of interment, the figures being 354 and 200 per annum, respectively. Some of the lodges are in need of painting and repairs, others are reported in excellent condition; the number of rooms in the lodges range from 3 to 17. Flagstuffs, of iron and wood, with a few exceptions, are in good condition; a few of them are said to be too short. The quality and sufficiency of the water supply and condition of drainage and sewerage are generally reported as fairly satisfactory. In some cases the supply of water is not sufficient for irrigating purposes. The reports indicate that the average estimated cost of maintaining a cemetery for one year, including the pay of the superintendent, is about \$1,800.

NATIONAL PARKS.

In compliance with instructions of the Secretary of War, contained in letter of the Adjutant-General of July 17, 1900, Lieut. Col. C. H. Heyl, inspector-general, visited and inspected the following national parks on the dates named, viz: National Military Park, Gettysburg, Pa., August 2 to 4, 1900; Chickamauga and Chattanooga National Military Park, Lytle, Ga., October 15 to 17, 1900; Shiloh National Military Park, Pittsburg Landing, Tenn., October 19 and 20, 1900, and Vicksburg National Military Park, Vicksburg, Miss., October 22 and 23, 1900.

MILITARY PRISONS.

During the fiscal year ending June 30, 1901, an inspection was made of the military prisoners confined in the United States Penitentiary at Fort Leavenworth, Kans. There were 49 military prisoners in confinement at the time of

United States Penitentiary.

inspection, who, on being questioned separately, unanimously expressed themselves as well satisfied with their treatment by the prison authorities, and everything indicated that they were in good health and well cared for. The deputy warden specially in charge of the military prisoners stated that they were the best-behaved prisoners in the institution, and showed more inclination to occupy their time than any of the others; and that they were studious, and made every effort to receive credit for good-time conduct. There is a library of 6,000 volumes for the use of the prisoners, and the police of the premises and the buildings was reported good. This inspection showed a very satisfactory condition of the United States Penitentiary, and reflects credit upon the military prisoners, as well as upon the officers who are charged with caring for them.

Alcatraz Island.

A special inspection was made of the military prison at Alcatraz Island, California, as to the capacity and availability of buildings, employment, exercise, privileges, special instruction, mental and moral recreation, and food of the prisoners, and as to special prison regulations and methods.

As a great number of prisoners are brought from the Philippines for confinement at Alcatraz Island, the construction of a new prison was found necessary; and at the time of inspection both the old and new prisons were in use, the new one having then but recently been completed. The old one, which was reported as unsafe and unfit, had a capacity for 166 prisoners. The new prison appears to be fairly satisfactory, and has a capacity for 304 prisoners. There was not then work enough to keep the prisoners fully employed, but this seems to have been remedied soon afterwards, and ample hours were allotted for exercise. The recreations consisted in going to chapel, reading and writing letters, and access to a library of 1,200 volumes on Saturday afternoons and Sundays. The chapel is fitted with desks for use as a schoolroom and writing room. It was reported that the prisoners appeared to be well fed and well cared for; and those questioned on the subject expressed themselves as well satisfied with the ration furnished. The rules and regulations governing the institution appear to be sufficient and proper, and it was reported that they seemed to be well carried out and the prisoners treated with justice. Those of the prisoners whose conduct is good are not required to march in lock step.

Cuartel España.

This prison, located in the city of Manila, P. I., was also inspected during the year. It receives prisoners from the Sixth Artillery, from trial by brigade summary court officer, from general hospitals, from the Signal Corps, and from enlisted men belonging to all organizations in and around Manila when it is impracticable to confine them at the station of their commands. The prison was reported as being generally satisfactory, and in a good state of police. At the time of inspection there were 45 prisoners in confinement, of whom only 16 were serving out sentences. The others were either awaiting trial or had been tried and were awaiting sentence. There is a hospital in connection with this prison, which was reported as in excellent condition, and supplied with all necessary appliances. The patients are subsisted on an allowance of 40 cents a day, which is said to be sufficient.

The United States military prison at Lingayen P. I., was inspected near the close of the fiscal year, and at the time of inspection 254 prisoners were in confinement there—38 general, 1 civilian, 39 garrison, and 176 native prisoners. The Americans and natives are subsisted in separate messes. There was no system of recreation. The prison was reported well organized and conducted, well policed, and the grounds in good condition, and the prisoners had no complaint to make about their treatment. No merit book was kept for the native prisoners so they might be given credit for good conduct as the white prisoners were, but this has been remedied since the inspection. The prison, it was said, had been much improved through the efforts of the officer in charge, and mostly by the labor of the prisoners. The prisoners make bamboo furniture, which is disposed of at weekly sales, and it was stated that a fund would be established with the proceeds of this labor. The hospital connected with the prison was reported in good condition and generally satisfactory.

COMMISSARY SALES LIST.

The law, Revised Statutes, 1144, imposes upon this department the duty of designating articles to be kept for sale by the Subsistence Department to officers and enlisted men.

Our Government is very liberal in supplying the wants of the soldier, but too much care can not be exercised in designating articles to be kept for sale by the Subsistence Department; otherwise there may be great accumulation of articles which there will be no sale for, especially in our new possessions. It would seem advisable to have a separate list of articles for sale in the Tropics. A great many articles which were recommended by this office have been dropped on the present list. In addition to articles which are components of the ration the following list of articles to be kept for sale by the Subsistence Department was approved by the Secretary of War June 13, 1901:

Apples.	Crabs.
Apricots.	Crackers.
Bacon, breakfast, dry-salt cured, or sugar cured.	Electro silicon.
Basins, hand.	Envelopes, letter.
Beef, chipped.	Extract of clams.
Blacking, shoe.	Farina.
Blanco.	Flavoring extract.
Blueing.	Flour.
Borax.	Gelatin.
Brooms, whisk.	Ginger.
Brushes, blacking.	Ham.
Brushes, hair.	Handkerchiefs, linen.
Brushes, tooth.	Ink.
Butter.	Jelly.
Can openers.	Lard.
Cheese.	Macaroni.
Chocolate.	Matches.
Cigars.	Metal polish.
Cinnamon.	Milk.
Clothes lines.	Molasses.
Clothes pins.	Mushrooms.
Cloves.	Mustard.
Cocoa.	Nutmegs.
Coffee, extra.	Oatmeal.
Combs.	Oil.
Corn.	Olives.
	Oysters.

Paper, toilet.
 Paper, letter.
 Peaches.
 Pears.
 Peas, green.
 Pencils, lead.
 Pepper.
 Pepper, chile colorado.
 Pickles.
 Pineapples.
 Pins.
 Pipes, brierwood.
 Polish, shoe.
 Potatoes.
 Preserves, damson.
 Razor strops.
 Salt, table.
 Sardines.

Sauce.
 Sausage.
 Shoestrings.
 Shrimps.
 Sirup.
 Soap, laundry.
 Soap, scouring.
 Soap, toilet.
 Soup.
 Starch.
 Sugar, white.
 Tapioca.
 Tobacco, chewing.
 Tobacco, smoking.
 Tongue, beef.
 Towels.
 Toweling.

The following is an extract from an indorsement on this subject submitted by me to the Lieutenant-General Commanding the Army:

* * * * *

Though in the exile and hardships of our soldiers few net expenditures by the Government have added so much as generous commissary supplies to all that makes life under such circumstances endurable, and also insured confidence that their Government was solicitous in caring for them always, certainly the administration of the law has now fallen into experienced, discreet, and generous hands, and it will be a pleasure for this Bureau to aid as far as power and opportunity is given under the law. * * *

The experience of many years has proved that the Quartermaster's Department can transport such articles readily to all garrisons, especially wherever there is steam transportation, and the mere multiplication of brands should not be allowed to confuse this possibility. Therefore the brands and varieties should be fairly limited in each post or battalion. These brands can perhaps be wisely limited to three for each article for a battalion and six for a department and only the best be furnished.

Great praise has been justly bestowed upon the excellence and variety of the subsistence stores when they arrived in Peking, China, and such a godsend can be fully appreciated even if not frequently so needed; but evidently the comfort and equal condition at the varied stations at which the soldiers serve may (as our recent volunteers and these beleaguered people found) depend largely upon how this considerate law is administered.

The law, for example, authorizes the sale of tobacco, and what prices were paid for it in private barter at San Juan Hill became generally talked about; but ought it to be allowed to deprive the soldier who does not use tobacco of the articles he needs? Similarly as to the simplest necessities, like salt or soap, which by repeated mention may make the list look large, * * * and such a comfort to the recruit as candy, need not be furnished in a dozen or more varieties. * * *

* * * At Manila, it is understood, a large number of articles were placed on the sales list in addition to these formerly designated—possibly without reference to or recommendation from this Bureau, but upon grounds deemed sufficient. * * *

Col. G. H. Burton, inspector-general, Department of Cuba, remarks as follows upon the subject of articles to be kept for sale by the Subsistence Department to officers and enlisted men:

The following is a list of the articles for which there is the most demand in this department and the percentage of loss by condemnation during the last three months:

	Per cent.
Apples, 3-pound cans.....	6. 43
Butter in jars.....	68. 80
Salmon, 1-pound cans.....	1. 94
Maple sirup.....	2. 57
Jelly, currant, 2-pound cans.....	33. 90
Olives, bottles, quarts.....	2. 85
Sauce, cranberry, cans.....	50

These percentages, however, can not be taken to illustrate the general loss in these articles, as many of these stores have been in the island of Cuba for three years, and in some instances reshipped several times.

In my judgment there are several articles which, if added to the regular sales list as prepared by the Commissary-General, United States Army, would add greatly to the comfort of officers and men. For instance:

Asparagus, canned; asparagus tips, canned; cherries; India relish, bottles; powdered horse-radish, bottles; witch-hazel; cigarettes, Havana, packages.

The articles of food mentioned would be a boon in this climate, where the variety of vegetables and relishes is indeed limited. The witch-hazel is universally recognized as useful in cases of bruises and stiffness, and is an excellent toilet article.

The cigarettes manufactured in Havana (several varieties) are of excellent qualities and very popular with Americans of all classes who have spent more or less time in the island. They are said to be practically as healthy as the cigar and there is great demand for them, and they could easily be sold at 2 cents per package of 15 cigarettes. They would, I think, be less injurious than the cigarettes now made by the soldiers from pipe tobacco and so-called rice paper.

The following is the proposed list of subsistence stores to be kept for sale in the Philippine Islands, submitted by Col. J. P. Sanger, inspector-general, Division of the Philippines:

Apples, 24-lb. cans.	Gelatin.
Asparagus.	Ginger ale, imported.
Bacon, sliced, 1-lb. cans.	Ham, deviled.
Basins, granite.	Ham, D. S. C.
Beans, stringless.	Handkerchiefs, linen, medium.
Beef, chipped.	Handkerchiefs, silk, white.
Beef extract, 4 ounces.	Ink, black.
Blacking, shoe.	Ink, indelible.
Blanco.	Jam, assorted.
Blanco, khaki.	Jam, blackberry, 2-lb. cans.
Bluing, powdered.	Jam, strawberry.
Brooms, whisk, medium.	Jelly, currant, 2-lb. cans.
Brushes, blacking, No. 2.	Lard.
Brushes, hair, medium.	Lobster.
Brushes, nail.	Listerine.
Brushes, shaving.	Lye, concentrated.
Brushes, tooth, assorted.	Macaroni.
Butter.	Matches, safety.
Buttons, bone, L. & S.	Milk, Eagle.
Buttons, collar, no hinge.	Milk, H. C.
Can openers, plain.	Milk, Australian concentrated.
Candy, stick, mixed, and chocolate.	Mushrooms.
Chamois skins.	Mustard, ground.
Cheese, American.	Mustard, French.
Cheese, Edam.	Needles.
Cherries.	Nutmegs.
Chocolate, plain.	Oatmeal, "R."
Chocolate, vanilla.	Olive oil, quarts.
Cigars, three varieties.	Olives, pints.
Cinnamon, ground.	Oysters, 2-lb. cans.
Cloves, ground.	Paper, letter, best.
Clothespins.	Paper, note, best.
Cocoa.	Paper, toilet, flat.
Coffee, M. & J. (roasted).	Peaches, 3-lb. cans.
Combs, rubber, medium.	Pears.
Combs, rubber, fine.	Peas, American.
Combs, pocket.	Pencils, lead, No. 2.
Corn, green.	Penholders.
Crackers, soda, 5-lb. tins.	Pens, fine.
Crackers, ginger, 5-lb. tins.	Pens, coarse.
Currants, 2-lb. tins.	Pens, stub.
Electro silicon.	Pepper, red, cayenne.
Envelopes, letter, best.	Pickles, C. C., pints.
Envelopes, note, best.	Pickles, gherkins, pints.
Flavoring extract, lemon.	Pickles, mixed, pints.
Flavoring extract, vanilla.	Pineapples, 2-lb. cans.

<p> Pins. Pipes, No. 1. Pipes, No. 4. Plum pudding. Preserves, damson. Preserves, raspberry. Preserves, strawberry. Raisins. Razors. Razor strops, Rappenhagen. Salt, table, bottles, Sardines, $\frac{1}{2}$. Sauerkraut. Sausage, Vienna. Sauce, tomato catsup. Sauce, Worcestershire. Shoe strings, black, linen, long. Shoe strings, tan, linen, long. Shoe strings, tan, porpoise, long. Shoe strings, tan, linen, short. Shoe strings, white, linen, short. Shoe polish, black (Whittemore's). Shoe polish, russet (Whittemore's). Soap, cuticura. Soap, glycerin (Pears's). Soap, lettuce. Soap, oatmeal. Soap, shaving stick. Soap, ivory or equal. Soap, sapollo. Soup, beef. </p>	<p> Soup, chicken. Soup, C. C. Soup, M. T. Soup, oxtail. Sponges, large. Starch, corn. Starch, laundry. Sugar, cut loaf. Sugar, granulated. Sugar, powdered. Tablets, letter, best. Tablets, note, best. Talcum powder. Tansan water. Tapioca. Thread, cotton, black. Thread, cotton, white. Thread, cotton, khaki. Thread, linen, black. Thread, linen, white. Thread, silk, black. Tobacco, plug, Climax. Tobacco, Durham. Toilet water, Colgate's. Tongue, beef. Tooth powder. Towels, huck, No. 2. Towels, bath, cotton. Towel, unbleached. Witch hazel. Wheat, rolled. </p>
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Maj. H. E. Tutherly, acting inspector-general, Department of Alaska, recommends the following list of articles of subsistence stores for the Department of Alaska, in addition to lists already authorized:

<p> Beef: Dried. Chipped. Tablets. Beans, lima. Bloaters, Yarmouth. Catsup, tomato. Caviar. Celery salt. Cheese: Potted, $\frac{1}{2}$ pound. Potted, 1 pound. Chicken, boneless. Turkey, boneless. Citron. Cocoanut, dried. Curry powder. Dates. Figs. Ham: Sliced. Whole can. Herring, boneless. Hops. Horse-radish. Maple sugar. Nuts: Almonds. Peanuts. Pecans. Popcorn. Walnuts. </p>	<p> Olives, stuffed. Orange peel. Preserves: Cherry. Ginger. Orange. Raspberry. Quince. Strawberry. Plum pudding. Raisins. Sage. Sauce: Chili. Tabasco. Sausage meat. Sausage: Frankfurter. Vienna. Club. Sauerkraut. Soup, Julienne. Vegetables, canned: Asparagus. Beans, lima. Beans, string. Beets. Cabbage. Pumpkin. Sauerkraut. Squash. Succotash. </p>
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Vegetables, canned—Continued.

Sweet potatoes.
Spinach.
Yeast cakes, Magic.
Miscellaneous:
Ammonia.
Brushes, button.
Brushes, shaving.
Button sticks.
Cards, bicycle.
Cards, steamboat.
Corn poppers.

Miscellaneous—Continued.

Garden seed.
Knives, pocket.
Listerine.
Mirrors, hand.
Oilcloth.
Padlocks.
Pearline.
Pencils, indelible.
Razors.
Suspenders.

CONTINGENT FUND OF THE INSPECTOR-GENERAL'S DEPARTMENT.

By act of Congress approved May 26, 1900, \$1,000 were appropriated for the contingent expenses of the Inspector-General's Department at the offices of the several department inspectors-general, being for the purchase of the necessary articles of office, toilet, and desk furniture, binding, maps, books of reference, and police utensils, for the fiscal year ending June 30, 1901.

This fund was allotted by the Secretary of War, upon recommendation of this office, to the several inspectors-general. It has been disbursed by officers of the Quartermaster's Department, and the vouchers, abstracts, and accounts current were transmitted to the Quartermaster-General's Office and by that office to the Inspector-General's Office, where they were examined and forwarded to the Auditor for the War Department for final settlement.

Prior to 1898 the appropriation was placed to the credit of the disbursing clerk of the War Department, who paid all vouchers upon the approval of the Inspector-General of the Army.

Under the provisions of the act approved March 2, 1901, this appropriation has been omitted as a separate item, and possibly, in lieu thereof, the amount has been merged into a like appropriation of the Adjutant-General's Department "For contingent expenses at the headquarters of the several military departments, including the staff corps serving thereat," as that appropriation is increased by \$1,000 and is to be expended in the discretion of the several military department commanders.

ALASKAN INDIANS.

Major Tutherly, in his report of inspection of Fort St. Michael, Alaska, made September 12, 1900, says:

There are no Indians in this vicinity requiring the presence of troops. There are, however, a few hundred destitute Indians scattered about this section, to whom as a humane necessity quite a quantity of subsistence stores have been issued between July 25 and date of inspection. * * * Medical attendance and medicines were also supplied to alleviate suffering from diseases prevalent among the Indians—measles, grippe, etc. During my journey down the Yukon River between Fort Gibbon and this post, deaths, sickness, and destitution among the Indians were casually reported to me to a far greater extent even than in the immediate vicinity of St. Michael; e. g., among about 600 Indians in the vicinity of Nulato there were 27 deaths in three weeks and about 220 sick, and it was said that this proportion would probably extend to neighboring villages, the general sickness being grippe and measles; and at Holy Cross Mission, Koserefsky, among about 200 Indians there had been 49 deaths; and in another smaller village nearly 11 deaths were reported. The former supply of game and revenue from furs has become reduced till fish catching is their principal means of food supply, and it would seem as though these Indians, and in fact all those scattered through Alaska, should come under the care of the Interior Department, similarly to those in the States, whereby a timely provision would be insured for food, medical attendance, and medicines.

CLERICAL FORCE.

I can not conclude this report more fittingly than by a reference to the clerks of this Department and Bureau. The zeal, intelligence, and devotion to duty which have been shown by them under every circumstance and condition merit my highest approbation, and it affords special pleasure to invite attention to the faithful, efficient, and valuable service which they have cheerfully rendered. The successful accomplishment of much of their work requires intense application and special ability, and frequently demands extra hours of labor, and they have habitually met every demand of whatever nature with the utmost cheerfulness.

This office enjoys a unique distinction in respect to its clerical force, which is that its chief clerk is compensated at the rate of a clerk of class 4, viz, \$1,800 per annum. This flagrant discrimination can hardly be defended, and the urgent necessity of a chief clerk at \$2,000 for this office, thus placing it upon the same footing as the other bureaus of the War Department, must be quite apparent and should need no argument to support it. The legal responsibilities of the position should be properly recognized and suitably rewarded, and the duties are not less exacting than for those occupying similar positions elsewhere in the War Department. And in order that an opportunity may be afforded to suitably reward long, faithful, and efficient service, permit a simple act of justice to deserving employees, and provide a chief for each of the divisions of the office, it is urgently recommended that the two additional clerks of class 4, as submitted in the annual estimate, be granted.

RETIREMENT OF CLERKS.

Any acceptable plan for the retirement of these valuable public servants without expense to the Government should receive fair and favorable consideration. As they have devoted their best years to the public service, some consideration seems due in their old age.

Respectfully submitted.

J. C. BRECKINRIDGE,
Inspector-General.

The SECRETARY OF WAR.

APPENDIX A.

THE INSPECTOR-GENERAL'S DEPARTMENT, UNITED STATES ARMY, IN CUBA, BY COL. G. H. BURTON, INSPECTOR-GENERAL.

* * * * *

In treating of the work of this department in the island of Cuba it will be necessary, as a prelude, to indicate its position in the Army and to define its scope and functions in our home government.

The corps of adjutants-general and the corps of inspectors-general in the Army of the United States are denominated the general staff, in contradistinction to staff officers, such as quartermasters, commissaries, ordnance officers, etc. The former is the bureau of orders and records, through which all orders and instructions emanating from lawful command pass to every branch of the service; the latter the department through which governing authority sees and hears the Army in its remotest ramifications, and its sphere of inquiry includes every branch of military affairs except when specially limited by regulations or orders. Inspectors-general are specifically cautioned to exercise a comprehensive and general observation within the command to which they may be respectively assigned over all that pertains to the efficiency of the Army, the condition and state of supplies of all kinds, of arms and equipments, of the expenditure of public property and moneys, and the condition of accounts of all disbursing officers of every branch of the service; of the conduct, discipline, and efficiency of officers and troops, and to report with strict impartiality in regard to all irregularities that may be discovered by them. From time to time they are required to make such suggestions as may appear to them practicable for the correction of any defects that may come under their observation. These functions, stated in detail, cover the morality, training, and discipline of the troops, conduct of officers and men, condition of supplies, of public animals, of transportation, the state and condition of posts of the command, and of all the departments therein.

In Cuba the inspector-general and his assistants have kept the military governor advised of the state of efficiency of the United States troops, respecting their training, discipline, general appearance, and behavior; of the state of their arms, equipments, and accouterments of all kinds; the sufficiency, fit, and uniformity of their clothing; as to whether commanding officers observe the system of instruction enjoined by regulations, and whether all officers and soldiers obey the orders of the Secretary of War and of their immediate commanders; whether justice is promptly and legally administered; whether all officers are efficient; whether any officer or soldier has distinguished himself or shown special efficiency in any department of study or duty; the manner in which chaplains perform their duties; the efficiency of staff officers and the correctness of their accounts; whether payments and issues have been made in accordance with law and regulations; whether surplus supplies have been taken up on returns and deficiencies accounted for. They have ascertained and reported the nature and number of all drills, recitations in tactics and drill regulations;

the amount and results of target practice, practice marches, practice in outpost duty, field service, minor tactics, gymnastic exercises, etc.

Through this department the military governor has been advised of the housing of the troops throughout the island, the condition of their barracks, the state of their messing, the sufficiency, variety, and preparation of their food; whether the labor of the supply departments is performed by soldiers or civilians, and if the latter, their number, cost, and reasons for their employment; the means of transportation—horses, mules, wagons, carts, etc.; number of public animals, serviceable and unserviceable, their condition, grooming, training, shoeing, and suitability for the service, veterinary treatment, etc.; the condition of all public property and accounts, and whether public property is secured against fire, theft, and damage; whether authorized sales of public stores are made to enlisted men according to regulations; the condition of the water supply at each post; the facilities for laundry work, bathing, and swimming; condition of sewerage and drainage; the means of extinguishing fire; whether the troops are organized into fire detachments and their efficiency therein; as to the management and success of the post exchange, and whether properly supplied and conducted according to regulations; the extent, necessity for, and kind of gardens, the number of men employed therein, and the success attending the same; the management and application of the regimental and company funds; whether the post, regimental, and company books of all kinds are correctly kept and all official papers properly filed; the condition of the cemeteries; efficiency of the hospital corps and company bearers; their proficiency in the litter-bearer drill and the method of rendering first aid to the wounded.

All disbursements by the United States Government in Cuba have been thoroughly examined and the balances verified on an average of every four months. To the credit of the Army it may be stated that since its arrival in Cuba no officer of the Regular Army has been found a defaulter, and many of them have expended large sums of money.

In addition to the duties above indicated, the department has investigated all questions arising at camps, posts, or wherever officers and troops may be serving, harmonizing differences where possible and reporting facts to the military governor where corrections by him were rendered necessary.

The department has inspected, five or six times a year, the money accountability of all officers—military or civilian, American or native—disbursing insular funds and reported the true state of their balances to the military governor. From the inception of the military government, January 1, 1899, to June 30, 1901, these frequent inspections have covered the examination of accounts involving transactions as follows: United States funds, \$39,271,708.02; insular funds, \$92,420,128.98. These large sums, made up of expenditures, transfers, redeposits, etc., required as delicate scrutiny as if consisting of expenditures only. The present system of inspection of money accountability in vogue in the inspector-general's department is the result of over a century's experience and is wellnigh proof against successful attempt at fraud. An idea of the minuteness and completeness of these inspections may be obtained from the following general statement of the methods pursued: First, a verification is made of all moneys received by the disbursing officer from the Treasury or by transfer from other officers; second, all vouchers are carefully examined with reference to their

form, legality, authority, and economy and compared with the stubs in the check books; third, all funds transferred to other officers or deposited to the credit of the Treasurer are noted and authenticated. The sum of all expenditures, transfers, and Treasury deposits subtracted from the total receipts will show the true balance for which the officer is accountable at date of inspection.

Oftentimes it is necessary for disbursing officers to keep cash on hand (although the practice is now reduced to a minimum), and in such cases the same is counted. The difference between the cash on hand and the balance due at date of inspection should be on deposit in the official depository. To ascertain if this balance is on deposit the last depository's statement (which is furnished all disbursing officers monthly) is examined and the balance at that date noted. All checks which have not been presented to the depository for payment and those issued since the date of last statement (called outstanding checks) are authenticated and a list thereof made, which is forwarded to the depository with request to note thereon any funds received to the credit of the disbursing officer, together with a statement of all checks paid since the last statement and the balance now standing to the credit of the officer. This, when received back from the depository, is compared with the inspector's statement of the officer's account and verification made accordingly. But the great function of the department here, as in the United States, is not so much to detect as to prevent fraud and to instruct inexperienced officers, both civilian and military, in the proper method of rendering accounts, bookkeeping, and the specific manner of stating vouchers. During the first six months of the department's duties in Cuba it was found that a great many inexperienced agents were drawing more or less large sums of cash on their official checks and keeping excessive amounts thereof in their safes, boxes, etc. In each case of this nature observed the officer was advised to turn the currency at once into authorized depositories and to pay all vouchers by check. During these inspections there have been many irregularities discovered and corrected, but it must be said, to the credit of the numerous officials, both military and civil, disbursing the island revenues, that there has not been but one defalcation of a grave character and not to exceed three or four of minor importance during the entire period of the American intervention. It can be safely stated that the inspector-general's department in Cuba has saved to the island government many hundreds of thousands of dollars, not so much by detecting frauds as by its constant and careful watchfulness over all expenditures and insistence upon compliance with the law respecting the propriety of and proper authority for disbursements of every nature.

In addition to the money responsibility recounted above, the department has inspected and reported upon, for the information of the governor-general, public property, various in character, such as railroads, buildings, wharves, sewers, parks, bridges, etc., with reference to their care and preservation, as well as the system of accounting and method of carrying on the work of the various departments of the military government, particularly as to the efficiency and economy thereof, and has made recommendations looking to a simplification of the work and a curtailment of expenses.

The ethics of the department are such that very little is known of its doings except to the officers concerned. All of its work is, more

or less, of a confidential character, and it is the solace of the department that its officers never spread its virtues before the public to cover its neglects. The duties of the office of an inspector-general are very laborious and the responsibilities grave. His travels are never-ending. He barely recognizes the comforts of home life from his first entry into the corps to old age. If honest and strictly conscientious, he must be prepared to part with many friends, for his duty calls for inexorable action, without fear, favor, or affection; hence few, if their prevision were equal to their after experience, would ever care to change a coveted position in the line to assume responsibilities so burdensome where resulting compensations are so rare. Therefore, to be efficient, an inspector-general must be independent in action; to be courageous, his permanency must be assured. The department has been fortunate in its encouragement by the military governor, General Wood, who believes in thorough and frequent inspections, and who at all times has furnished aid and given directions to uplift the department in the fulfillment of its duties. The Cuban government could not do better, at its inception, than to appoint its inspectors—whether in its army, custom-house, treasury, or internal-revenue service—from men of high standing, with tenures for life or during good behavior—their fairest hope of insuring virtuous administration.

82	Denison University, Granville,	1881	300	283	70	82	20	10	47	1	1	3	2	6	3	6	81	96
83	Miami University, Oxford,	1869	700	250						1	1	3	1	3	3	6	81	96
84	State Agricultural College, Corvallis,		700	250						1	1	3	1	3	3	6	81	96
85	Bishop Scott Academy, Portland,																	
86	The Pennsylvania State College, State College,	1869	1,500	420	346	275	7	226		1	4	4	4	4	26	12	204	246
87	Pennsylvania Military College, Chester,	1862	150	153					130									
88	Grove City College, Grove City,	1876	800	370	256	165	22	33	166	1	3	3	4	3	12	9	146	170
89	Grard College, Philadelphia,	1848	1,620	1,510	221	477	14	19	491	1	6	3	6	3	50	18	437	508
90	Franklin and Marshall College, Lancaster,		300	64	80	80												
91	The Susquehanna Collegiate Institute, Towanda,				30				12									
92	Brown University, Providence,		250	89	88	60	18	5	42		1	1	1	1	4	42	48	
93	College of Agriculture and Mechanic Arts, Kingston,	1888																
94	Porter Academy, Charleston,																	
95	South Carolina Military Academy, Charleston,																	
96	Clemson Agricultural College, Clemson College,																	
97	Agricultural College of South Dakota, Brookings,		500	378	87	20												
98	University of South Dakota, Vermillion,		Unlimited,	200	76	18												
99	Jesse M. Aydelott College, Tullahoma,	1794	500	339	196	164	18	9	135	1	2	3	19	6	121	149		
100	University of Tennessee, Knoxville,		300	142	76					1	2							
101	University of the South, Sewanee,	1868								1	2							
102	Agricultural and Mechanical College of Texas, College Station,																	
103	Baylor University, Waco,		180	138	138	120	17	12		1	3	1	2	6	101	110		
104	West Texas Military Academy, San Antonio,	1883																
105	Agricultural College of Utah, Logan,		500	250	166				71									
106	University of Vermont, Burlington,	1791	400	230	150				116	1	4							
107	Norwich University, Northfield,	1819	150	79	79	74	20	9	67	1	2	3	1	6	64	74		
108	Vermont Academy, Saxton River,																	
109	Virginia Agricultural and Mechanical College, Blacksburg,	1872	350	386	365	335	17	38		1	5	11	4	28	258	301		
110	Virginia Military Institute, Lexington,																	
111	Danville Military Institute, Danville,																	
112	University of Washington, Seattle,																	
113	Washington Agricultural College, Pullman,	1881	1,000	416	413	194	19	0		1	2	3	2	14	7	109	132	
114	Gonzaga College, Spokane,	1887	250	215	110	100	14	5	86		2	1			6	94	101	
115	West Virginia University, Morgantown,	1867	1,200	648	144	136	19		132	1	3	5	14	9	113	141		
116	Lancasterian Academy, Wheeling,																	
117	State University of Wisconsin, Madison,	1848	1,993	1,993	618	557	23	9	338	1	2	6	12	27	18	561	618	
118	St. Joan's Military Academy, Delafield,	1884	150	150	150	135	17	25	80	1	3	2	4	8	66	80		
119	University of Wyoming, Laramie,	1886	500	84	71				42		1							
Total			42,515	33,969	15,272	10,854		1,198	7,391	4	61	227	163	608	528	8,044	9,344	

Information pertaining to universities, colleges, etc.—Continued.

Military department.																		
Practical instruction and some work performed.																		
No.	Name and location.	Drills.					Field work.					Guard mounting.		Target practice.				
		Infantry.	Artillery.	Cavalry.	Competitive.	Exhibition.	Signal.	Drum.	Street.	Problems in minor tactics.	Practice marches.	Encampments held.	Mounted and maintained.	Officer of day detailed.	Number.	Average attendance.	Average shots per cadet.	Number of gal-
1	Alabama Polytechnic Institute, Auburn.	101			3	1		13	1	0	1		Daily					
2	University of Alabama, Tuscaloosa County, University P. O.																	
3	University of Arkansas, Fayetteville.	87	0	0	3			10	0	0			0	Every school day				
4	Owachita Baptist College, Arkadelphia.	142			0					0			4	At guard mount-	200	(4)		
5	Spears-Langford Military Institute, Sealey.	70	60	0	1		130	(1)	1	0	0		0	ing.				
6	University of California, Berkeley.	111	6	0	2	0		22	0	0	0		4	Daily.	3	23	5	0
7	St. Matthew's Military School, San Mateo.	100	40		0	1	6	30		0	1		8	At guard mount-	10	64	15	
8	Mount Tamalpais Military Academy, San Rafael.	95	8					15						ing.		125		
9	State Agricultural College, Fort Collins.																	
10	Yale University, New Haven.	70	12		2	2		4	1	1								
11	Delaware College, Newark.																	
12	Florida Agricultural College, Lake City.																	
13	North Georgia Agricultural College, Dahlonega.																	
14	Gordon Institute, Barnesville.	125	8	0	1	0	35	1	0	1	2	1	3	only during en-	0			
15	Middle Georgia Military and Agricul-													campment				
16	tural College, Milledgeville.													None.	2	10	54	36
17	University of Idaho, Moscow.	90			0	0		0	0	0	0	0	0					
18	University of Chicago, Chicago.	112	56	0	2	2		5	1	0	0	0			0			
19	University of Illinois, Champaign.																	
20	Knox College, Galesburg.																	
21	Northern Illinois Normal School, Dixon.																	
22	Western Military Academy, Upper Alton.																	
23	Northern Military Academy, High-																	
24	land Park.																	
25	De Pauw University, Greencastle.																	
26	Vincennes University, Vincennes.																	
27	Purdue University, Lafayette.																	
28	Culver Military Academy, Culver.	169	6	121	3	15	10	3			0	1	265	Daily	12	60	18	25

		70	20		2	* 2	20	197	1	0	3	0	49	do.	1	80	5
27	Howe School, Lima.....																
28	Cornell College, Mount Vernon.....																
29	Iowa State University, Iowa City.....																
30	Iowa Wesleyan University, Mount Pleasant.....																
31	Simpson College, Indianola.....	76			0	0		6	1	0	0	0					
32	Iowa State Normal School, Cedar Falls.....																
33	State Agricultural College, Manhattan.....	79	12		1	1		10	1	0			12		20	91	19
34	Baker University, Baldwin.....																
35	St. John's Military School, Salina.....																
36	Agricultural and Mechanical College of Kentucky, Lexington.....																
37	Central University of Kentucky, Richmond.....																
38	Georgetown College, Georgetown.....																
39	Louisiana State University and Agricultural and Mechanical College, Baton Rouge.....																
40	The University of Maine, Orono.....	8											4				
41	St. John's College, Annapolis.....	76	14		0	3	6	20	1	0	0	0		At all times.	0		
42	Maryland Agricultural College, College Park.....	190															
43	Massachusetts Agricultural College, Amherst.....	92	10	0	0	3	0	*14	2		0	0			9	24	16
44	Massachusetts Institute of Technology, Boston.....	29	0	0	0	0	0	6		0	0				8	20	0
45	Michigan Military Academy, Orchard Lake.....	141	10	109			65	14									
46	Michigan Agricultural College, Lansing.....	140			8	0	45	15	0	0	0	0	0	None.			
47	University of Minnesota, Minneapolis.....	93	32	25	2	0	0	3	0	0	0	0	3	do.	0		
48	Bishop Seabury Mission, Fairbault.....	30			1	0		10	1					Daily	8	30	
49	Agricultural and Mechanical College of the State of Mississippi, Agricultural College.....																
50	University of the State of Missouri, Columbia.....																
51	St. Louis University, St. Louis.....	140	20	25	2	2	0		1	0	1	0	0	At drill	0		
52	Wentworth Military Academy, Lexington.....				1		0	10	15	0	12	0	365				
53	Blees Military Academy, Macon.....	152	114	228			135	10	4		4	1	865	Daily		74	25
54	Kemper School, Booneville.....																
55	Montana College of Agriculture and Mechanic Arts, Bozeman.....																
56	University of Nebraska, Lincoln.....																
57	Doane College, Crete.....																
58	State University of Nevada, Reno.....				1	2	216		2	0	0	0	0	None.	0		
59	New Hampshire College of Agriculture and the Mechanic Arts, Durham.....	100	0	0	1	2	32	2	0	0	0	0					
60	Rutgers College, New Brunswick.....							10					4				

* Undreas.

² No military instruction during year.
³ Nine essays on military subjects read by military professor.

¹ Numerous parades held.
² All of junior class at yards.

[illegible]

Information pertaining to universities, colleges, etc.—Continued.

Name and location.		Military department.						Number of former students who served in recent wars.												
		Theoretical instruction.						Army—Regular and volunteer service.						United States Navy and Marine Corps.						
		Recitations in.						General officers.	Colonels.	Lieutenant colonels.	Majors.	Captains.	Lieutenants.	Noncommissioned officers and privates.	Total.	Commissioned officers.	Warrant officers and enlisted men.	Total.		
Art of war.	Average attendance.	Drill regulations.	Average attendance.	Organization and administration of Army.	Average attendance.															
No.																				
1	Alabama Polytechnic Institute, Auburn.			30																
2	University of Alabama, Tuscaloosa County.																			
3	University of Arkansas, Fayetteville.	0		12																
4	Quachita Baptist College, Arkadelphia.	(1)																		
5	Spaulding Military Institute, Spaulding.																			
6	University of California, Berkeley.	120	120	30	24	5	24		2		1	4	8	27	157	5	5	10	52	
7	St. Matthew's Military school, San Mateo.	1	24	30							1				36			7	43	
8	Mount Tamalpais Military Academy, San Rafael.			10																
9	State Agricultural College, Fort Collins.																			
10	Yale University, New Haven.														340				340	
11	Delaware College, Newark.			12	65										30				30	
12	Florida Agricultural College, Lake City.														22				22	
13	North Georgia Agricultural College, Dahlonega.																			
14	Gordon Institute, Barnesville.														36				36	
15	Middle Georgia Military and Agricultural College, Milledgeville.																			
16	University of Idaho, Moscow.	0		12		0						1	4	35	40	1		1	41	
17	University of Chicago, Chicago.	12	12	36	18	0									22				22	
18	University of Illinois, Champaign.	21	19	67	366	4	19								51		4	4	55	
19	Knox College, Galesburg.																			
20	Northern Illinois Normal School, Dixon.																			
21	Northern Military Academy, Upper Alton.																			
22	Northwestern Military Academy, Highland Park.														18				18	
23	De Pauw University, Greencastle.																			
24	Vincennes University, Vincennes.																			
25	Fordham University, Lafayette.																			
26	Culver Military Academy, Culver.	12	35	30	40	0									21				21	

Information pertaining to universities, colleges, etc.—Continued.

No.	Name and location.	Military department.										Number of former students who served in recent wars.									
		Theoretical instruction.										Army—Regular and volunteer service.									
		Recitations in.										Noncommissioned officers and privates.									
		Art of war.	Average at- tendance.	Drill regu- lations.	Average at- tendance.	Organization and admin- istration of Army.	Average at- tendance.	Number of lec- tures.	General officers.	Colonels.	Lieutenant colo- nels.	Majors.	Captains.	Lieutenants.	Noncommissioned officers and pri- vates.	Total.	Commissioned officers.	Warrant officers and enlisted men.	Total.	United States Navy and Marine Corps.	Total Army and Navy.
62	Du La Salle Institute, New York City	0	0	16	12	0	0	19	1	1	1	4	9	34	68	116	29	0	0	0	0
63	Cornell University, Ithaca	10	7	40	24	4	7	10									116	35	16	61	167
64	St. John's College, Fordham, New York City	0	0	24	35	3	30	15				2		2	5	14	14	2			11
65	St. John's Military School, Manlius	16	20	16	15												108				
66	New York Military Academy, Cornwall on the Hudson	0	0	30	40	0	0	6		3	1	2	8	11	38	63	13				
68	Riverview Academy, Poughkeepsie	0	0	30	40	0	0	6													
69	Peekskill Military Academy, Peekskill	0	0	30	40	0	0	6													
70	Fairfield Seminary and Military Academy, Fairfield	0	0	30	40	0	0	6													
71	Haldane Union School, Coldspring	0	0	30	40	0	0	6													
72	Bingham School, Asheville	0	0	30	40	0	0	6													
73	North Carolina College of Agriculture and Mechanic Arts, Raleigh	42	14	24	39	2	14	4	0	0	0	0	0	4	34	38	15	0	0	0	0
74	North Dakota Agricultural College, Fargo	0	0	21	14	0	0	12	0	0	0	0	0	1	12	13	13	0	0	0	0
75	University of North Dakota, Grand Forks	0	0	18	15	0	0	17	0	0	0	0	0	1	12	13	13	0	0	0	0
76	Marquette College, Marquette	0	0	16	60	0	0	3	0	0	0	0	0	0	0	0	110	0	0	0	0
77	Ohio State University, Columbus	0	0	16	60	0	0	3	0	0	0	0	0	0	0	0	110	0	0	0	0
78	Ohio Normal University, Ada	0	0	16	60	0	0	3	0	0	0	0	0	0	0	0	110	0	0	0	0
79	Ohio Wesleyan University, Delaware	0	0	16	60	0	0	3	0	0	0	0	0	0	0	0	110	0	0	0	0
80	Willamette University, Willamette	0	0	16	60	0	0	3	0	0	0	0	0	0	0	0	110	0	0	0	0
81	Ohio Military Institute, College Hill, Cincinnati	0	0	16	60	0	0	3	0	0	0	0	0	0	0	0	110	0	0	0	0
82	Denison University, Granville	0	0	16	60	0	0	3	0	0	0	0	0	0	0	0	110	0	0	0	0
83	Miami University, Oxford	0	0	16	60	0	0	3	0	0	0	0	0	0	0	0	110	0	0	0	0
84	State Agricultural College, Corvallis	0	0	16	124	0	0	0	0	0	0	0	0	0	0	0	10	0	0	0	0
85	Bishop Scott Academy, Portland	0	0	16	124	0	0	0	0	0	0	0	0	0	0	0	50	0	0	0	0
86	The Pennsylvania State College, State College	0	0	16	124	0	0	0	0	0	0	0	0	0	0	0	61	0	0	0	0

[illegible]

¹ Between 50 and 60: all commissioned.

²Not known.

APPENDIX C.

INSPECTION OF TRANSPORTS.

The following table shows the number of inspections of transports made by officers of the Inspector-General's Department during the past fiscal year; also the number of reports made by commanding officers of troops on board transports under paragraph 199, Regulations for the Army Transport Service, and received in this office for the same period:

Name of transports.	Number of inspections.	Number of reports under paragraph 199, transport regulations.
United States transports:		
Buford.....	7	2
Burnside.....	5	
Crook.....	2	
Cyrus Wakefield.....	1	
Egbert.....	4	
Grant.....	11	4
Hancock.....	13	1
Kilpatrick.....	4	2
Lawton.....	6	2
Logan.....	9	2
McClellan.....	5	
McPherson.....	2	
Meade.....	8	1
Rawlins.....	5	
Relief.....	2	
Rosecrans.....	6	1
Samoa.....	3	
Sedgwick.....	4	
Sheridan.....	8	2
Sherman.....	6	1
Slocum.....	1	
Sumner.....	7	2
Thomas.....	10	4
Warren.....	4	1
Wright ¹	2	
Chartered transports:		
Algoa.....	1	
Arab.....	1	
Athenian.....	1	
Aztec.....	6	
Belgian King.....	1	
Californian.....	2	
Conemaugh.....	1	
Federica.....	4	
Flintshire.....	1	
Garonne.....	5	2
Indiana.....	8	2
Kintuck.....	4	
Leelanaw.....	2	2
Lennox.....	5	1
Ohio.....	3	1
Oopack.....	2	
Packling.....	6	
Pennsylvania.....	6	
Petrarch.....	1	
Port Albert.....	1	
Port Stephens.....	3	
Siam.....	1	
Strathgyle.....	2	
Thyra.....	5	1
Westminster.....	1	
Wyefield.....	3	
Bosnia ¹	1	
Catania ¹	1	
Universe ¹	1	
Total.....	214	34

¹ Reports not yet received.

The following data taken from the reports received indicate in detail the condition of the vessels owned and chartered by the Government for use of the army transport service:

UNITED STATES TRANSPORTS.

Buford. The *Buford*, a steel ship 11 years old, cost \$400,000 to fit up. Has a maximum speed of 12 knots, average 11; 380 feet long and 44 feet in breadth. Net tonnage, 2,534. Well fitted with necessary appliances. The permanent assignment of state-rooms has been criticised. Air space on troop decks not up to legal requirements. Crew's quarters overcrowded. Distilling apparatus broke down. Ventilating apparatus proved insufficient at times. Messing facilities for cabin inadequate; ovens insufficient. Cold storage not satisfactory for cooling water for drinking purposes. No ice machine. Plumbing reported bad, and criticised by inspector. Washboards needed in laundry. Storerooms not ventilated with due regard to the health of the troops. No guard or prison room, and no treasure chamber. Quartermaster's supplies exceed the need of the ship; bunk bottoms (canvas) too light. Sale of cigarettes on board should be discontinued. Repairs made to vessel not satisfactory as to workmanship. "The *Buford* is now a fine transport in every particular, except that there is very limited deck space for soldiers."

Burnside. The *Burnside* is an iron ship, 9 years old, which was captured in the war with Spain. She is 294 feet long by 36½ feet in breadth. Net tonnage, 1,405. Her life-saving apparatus was reported in generally bad condition. The quality of her coal was only fairly satisfactory. She has been recently repaired and refitted at a cost of \$26,027.76 in gold, at Hongkong, and the repairs were apparently satisfactory in workmanship and cost.

Crook. The *Crook* is an iron vessel, 8 years old; cost not reported. She is 435 feet long, has an average speed of 11 knots, and a net tonnage of 2,703. Her steering apparatus was very rusty in parts. Engines old, obsolete, and insufficient; boilers old, worn, and insufficient. Steam windlass unsatisfactory. No ice plant. Water-closets and urinals insufficient. No laundrying facilities. Her general condition was very good except engines and boilers, and she was reported "an excellent sea boat and very steady."

Cyrus Wakefield. The *Cyrus Wakefield* is a wooden vessel, 19 years old, that cost \$45,000. She is 247 feet long by 43 feet 7 inches in breadth, and has a net tonnage of 1,941. Her speed is not reported. So far as reported, she was in every way in good and satisfactory condition.

Egbert. The material of which the *Egbert* is constructed is not reported. She is 12 years old and cost \$200,000. She is 332 feet long by 39 feet 3 inches in breadth; has an average speed of 10½ knots and a net tonnage of 1,875. Her ventilation was insufficient. The hospital had no isolation ward; there were no laundrying facilities, and no treasure chamber except a large safe. The crew was reported excessive in the steward's department. She is employed as a freight transport, and was reported as in "a good, seaworthy condition."

Grant. The *Grant* is a steel vessel, 19 years old, which cost \$660,000. She is 415 feet long by 49 feet in breadth, and has a net tonnage of 3,604 and an average speed of 12.1 knots.

Messing facilities for cabin passengers were inadequate. No laundry facilities; no isolation ward in hospital; no treasure chamber. The vessel was reported as in generally good condition.

Hancock. The *Hancock* is an iron vessel, 22 years old, that cost \$660,000 and which was refitted at a cost of \$460,000.

She is 475 feet long by 45 feet 4 inches in breadth; has an average speed of 15 knots and a net tonnage of 2,657. The troop decks were reported as slightly circumscribed. Hospital has no operating room. No laundrying facilities. The inspector states that some general repairs are needed and that "the general police and condition of the ship are excellent."

Kilpatrick. The material of which the *Kilpatrick* is constructed was not reported. She is 11 years old, is 370 feet long by 44 feet in breadth, has an average speed of 11.4 knots, and her net tonnage is 2,383. All the scuppers do not discharge below the water line. There was an insufficiency of bunks for troops. Her boilers were in bad condition. She had no ventilating apparatus and no cold storage separate from the refrigerating plant. No shower baths and no laundrying facilities. No repair shop for repair of the ship's machinery. The hospital is a makeshift only. No treasure chamber. Inspector recommends that troops and passengers be not carried.

Lawton. The *Lawton* is a steel vessel, 12 years old, that was first bought by the Navy Department and afterwards transferred to the War Department, which has expended \$136,650 in fitting her up for the army service. She is 250 feet long by 43.2 feet in breadth, and has a net tonnage of 2,332, and an average speed of 11½ knots. Her ventilating system is not modern, and she has no refrigerating plant and no ice machine; no treasure chamber.

Logan. The *Logan* is an iron vessel, 16 years old, whose cost is not reported. She is 445 feet long by 49 feet in breadth, and she has an average speed of 11½ knots and a net tonnage of 4,407. The quality of her coal was reported as only fairly satisfactory. The inspector says:

There were no complaints during the voyage arising from the condition of affairs.

McClellan. The *McClellan* is a steel vessel, 16 years old, that cost \$175,000. She is 336 feet long by 38½ feet in breadth, has an average speed of 12 knots, and a net tonnage of 2,279. Her steering apparatus was only in fair condition. Bottoms of bunks for troops were badly rusted. Her ventilation is insufficient, and there is no ventilating plant for troop decks. No ice plant. The defective plumbing has been repaired. No laundering facilities. The inspector says:

I was impressed with the efficiency of the officers, the discipline of the crew, and the good order and cleanliness of all the different departments.

McPherson. The *McPherson* is a steel vessel, 21 years old, that cost \$250,000. She is 420 feet long by 39½ feet in breadth, and has an average speed of 12 knots and a net tonnage of 2,277. Her steering apparatus was in fair condition only. The troop decks were not well ventilated and the cooling tanks were not satisfactory. Cold-storage apparatus only fairly satisfactory. No ice plant. No laundering facilities. The inspector says:

I was most favorably impressed with the general condition of this ship. It was very clean and neat throughout.

Meade. The *Meade* is a steel vessel, 27 years old, that cost \$400,000, and \$250,000 were expended in fitting her up as an army transport. She is 510 feet long by 44 feet in breadth, has a speed of 14 to 15 knots and a tonnage of 3,375. Her general condition was very good, and the inspector says:

The sanitary condition of the ship was excellent, and she was exceptionally clean.

Rawlins. The material of which the *Rawlins* is constructed was not reported. She is 7 years old, is 299½ feet long by 40 feet in breadth, has a net tonnage of 2,126, and an average speed of 13½ knots. Her life-saving apparatus reported as insufficient. Many bunks rusty. Heating insufficient. Facilities for washing mess kits insufficient. It has no refrigerating plant, but one was in contemplation. No ice plant. The hospital was in very poor condition, and was but ill adapted to its purposes. The condition of the isolation ward was also poor. No laundering facilities. The general condition of the vessel appears to have been good, but its bottom was foul. The inspector says:

The ship made a good showing, and in general was clean.

Relief. The hospital ship *Relief* is a steel vessel, 5 years old; cost not reported. She is 313 feet long by 46 feet in breadth; has a net tonnage of 1,987 and a speed of 11 to 12 knots. Her life-saving apparatus was mostly in good condition. She had no mechanical ventilating apparatus, and her refrigerating apparatus was insufficient. Her general condition was reported as satisfactory in all respects. The inspector says:

Taken as a whole, hospital and ship, the *Relief* reflects great credit on the departments which fitted her out and the officers who are serving on her.

Rosecrans. The *Rosecrans* is a steel vessel, 18 years old; cost not reported. She is 345 feet long by 38 feet 2 inches in breadth, and has a net tonnage of 1,816 and an average speed of 10½ knots. Her life-saving apparatus was generally in good condition. The passenger cabins are badly arranged and have insufficient air space. The coal she was using was reported as not satisfactory and her ventilating apparatus as insufficient. She had no refrigerating plant and her cold-storage facilities were insufficient. No ice plant. The condition of the hospital was poor and it was too small. There was no diet kitchen. No wash basins for the crew and no laundering facilities. The condition of the storeroom was not good. The medical supplies were reported as inferior. She was stated to be "seaworthy in all respects."

Samoa. The *Samoa* is a steel vessel whose age was not reported. She cost \$425,000 and has been repaired at an additional cost of \$32,275, a total cost of \$457,275. She is 465 feet long by 52 feet in breadth, has an average speed of 9 knots, and a tonnage of 4,507. No life-saving apparatus was reported. She carried no troops or passengers, but was fitted up for freight only. It was stated that her boilers needed repairs. She had no regular hospital, but had all necessary medical supplies. She was reported to be "too slow," and was generally in good condition. The inspector says:

She appears to be suitable for the transportation of freight and animals, for which purpose she was purchased.

Sedgwick. The material of which the *Sedgwick* is constructed was not reported. She cost \$200,000, is 28 years old, is 461 feet long by 44 feet in breadth, has a net tonnage of 2,924, and an average speed of 14 knots. Her scuppers discharge above the water line. It is stated that "except for short voyages in mild weather this ship would be uncomfortable for troops." Her fire-extinguishing apparatus was in fair condition only. Facilities for washing mess kits poor. No refrigerating plant. No isolation ward proper in hospital. No searchlight. No bathing facilities for troops, but sufficient for officers, passengers, and crew. No laundering facilities. The discipline of the crew was reported as not satisfactory. The general condition of the ship was good, but her bottom was foul.

Sheridan. The *Sheridan* is a steel vessel, 11 years old, that cost \$660,000, and has received repairs to the amount of \$320,000. She is 460 feet in length by 49 feet in breadth, has a net tonnage of 3,604, and an average speed of 12 knots. There has been some complaint in regard to the permanent arrangement of state-rooms in the cabin. No laundering facilities. Her general condition is stated to be satisfactory, and the inspector says:

The vessel is well equipped and supplied, and is satisfactory and seaworthy in every respect.

Sherman. The *Sherman* is a steel vessel, 8 years old, that cost \$660,000. She is 452 feet in length by 43 feet in breadth, has a net tonnage of 3,725, and an average speed of 12 knots. There is no isolation ward in the hospital. No steam laundry. The vessel appeared to be in good condition generally.

Sumner. The *Sumner* is a steel vessel, 14 years old, and cost \$168,000. She was fitted up for the army transport service at an additional cost of \$650,000, and repairs to the amount of \$100,000 have since been made on her, making her total cost \$918,000. She is 365 feet in length by 43 feet in breadth, has a net tonnage of 2,182, and an average speed of 13½ knots. The air space of the troop decks is reported as insufficient. Fire-extinguishing apparatus insufficient. It is also stated that the capacity of the coal bunkers (870 tons) is not sufficient. No treasure chamber. It is stated that the repairs on this vessel have been thoroughly well done; also that the expense per capita for carrying men on this vessel is greater than on some other transports. Generally she was in good condition. The inspector says:

The *Sumner* is by no means an economical vessel, and her carrying capacity is small in comparison with her cost.

She has a capacity for 60 passengers and 957 troops.

Thomas. The *Thomas* is a steel vessel, 7 years old, and cost \$660,000. She is 460 feet in length by 50 feet in breadth, and has a net tonnage of 4,284.47, and an average speed of 11 knots. Her air space on the troop decks is 80 cubic feet per man. She has no treasure chamber. Her general condition was good.

Warren. The *Warren* is a steel vessel, 12 years old, that cost \$200,000. She was fitted up for the army transport service at an additional cost of \$148,194, and has since received repairs to the amount of \$194,341, making her total cost so far amount to \$542,535. She is 380 feet in length by 43 feet in breadth; has a net tonnage of 2,925, and a speed of 11½ to 13 knots. Her scuppers dis-

charge into the bilges. The condition of the troop decks was stated to be unsatisfactory and the air space insufficient and the quarters for the crew too circumscribed. There was no heat for the troop decks. The dining room for cabin passengers was too crowded. The vessel has no searchlight, no laundering facilities, no prison room, and no treasure chamber. The vessel has just been overhauled at a cost of nearly \$195,000, and the repairs were said to be satisfactory and the vessel in a generally good condition. The inspector says:

The use of this vessel ought to be confined principally to freight and no further expenditure made in fitting her out as a troop ship.

Slocum.

The tug *Slocum* is equipped for harbor service only. Her cost is not reported, but she has received repairs to the amount of \$22,500. She is 3 years old, 165 feet in length by 29 feet in breadth; has a net tonnage of 337, and an average speed of 11 knots. She is reported as staunch and seaworthy, and the inspector says:

This tug will save much expense in hire for towing and at the same time will be of great service in the transportation of troops and supplies in and about the harbor.

CHARTERED TRANSPORTS.

Algoa.

The *Algoa* is a steel vessel, 5 years old, and was chartered by the Government at a rental of \$750 a day. The cost of refitting and repairing her for the army transport service is not stated. She is 475 feet long by 58 feet in breadth; has a net tonnage of 4,896, and an average speed of 11 knots. She was fitted up as a freight transport only and, so far as reported, was in generally good condition.

Arab.

The *Arab* is a steel vessel, 11 years old, that was chartered by the United States at a daily rental of \$600. She was fitted up for the transport service at a cost of \$35,000. She is 388 feet in length by 46 feet and 3 inches in breadth, and has a net tonnage of 2,674, and an average speed of 10 knots. Her scuppers discharge into the bilges. Her boilers were reported as in poor condition and her ventilating apparatus as not altogether satisfactory. The wires of the electric-light plant were not protected. She has no regular hospital. It was stated that her repairs had been improperly done, and new repairs were being made at the time of inspection. She has stalls for 690 animals, but their arrangement was not altogether satisfactory.

Athenian.

The *Athenian* is an iron vessel, 27 years old, that was chartered by the United States at a daily rental of \$450. The cost of refitting and repairing her, if any, has not been reported. Her dimensions are not given, but she has a net tonnage of 2,439, and a speed of 9 to 12 knots. One of the water tanks was in bad condition. She has the exhaust system of ventilation, and it was stated to be not entirely satisfactory. Her general condition was excellent throughout. She had stalls for 398 animals, which were not entirely satisfactory in arrangement, as the drainage was not good. The inspector says:

The record of this ship in carrying animals is excellent.

Aztec.

The *Aztec* is a steel vessel, 7 years old, that was chartered by the United States Government at a rental of \$500 a day, and \$30,000 were expended in refitting her for the army transport service. She is 370 feet in length by 43 in breadth; has a net tonnage of 2,298, and an average speed of 10 knots. Some of her scuppers discharge into the bilges. She has no refrigerating plant, no ice machine, and no regular hospital. She was found seaworthy, and the inspector said: "This ship is well adapted for a horse transport." She has padded stalls, with satisfactory drainage, for 480 animals.

Belgian King.

The *Belgian King* is an iron vessel, age not stated, which was chartered by the United States Government at a daily cost of \$600. She was refitted and repaired for the army transport service at a cost of \$28,000. She is 382 feet in length by 41 feet in breadth; has a net tonnage of 2,170, and an average speed of 10 knots. Her troop decks were not well ventilated. Her only refrigerating and cold-storage facilities consist of two large ice boxes. She was stated to be well equipped in every respect. She has stalls for 185 animals.

Californian.

The *Californian* is a steel vessel, age not stated, that was chartered by the United States Government at a daily rental of \$600. The cost of refitting and repairing her for the army transport service, if any, has not been reported. She is 435 feet in length by 51 feet in breadth, and has an average speed of 10 knots. Her tonnage is not given. She was in good condition generally, and the inspector says:

This ship, although slow, will be an excellent freight vessel.

Conemaugh.

None of the details of the history, dimensions, equipment, etc., of the United States chartered transport *Conemaugh* are given in the reports received. The inspector remarks:

With the exception of a few repairs to horse stalls, and whitewashing (nearly completed), she is in proper condition, with full crew and equipment, and with ample supplies, as regards water and food for the animals and attendants ordered to Manila, on her.

Federica.

The *Federica* is a steel vessel, 2 years old, which was chartered by the United States Government at a rental of \$550 a day. She was refitted for the army transport service at a cost of \$45,000. She is 360 feet in length by 46 feet in breadth, and has a net tonnage of 2,313, and an average speed of 9½ knots. Her scuppers are insufficient. No refrigerating plant, no ice machine, and no regular hospital. She has padded stalls for 436 animals.

Garonne.

The details of the history, dimensions, cost, etc., of the United States chartered transport *Garonne* were not stated in the report received. So far as reported, she appeared to be in a generally good condition, and the only exception noted was that some instruments were lacking in the surgical outfit of the hospital.

Indiana.

The *Indiana* is an iron vessel, 28 years old, which was chartered by the United States Government at a rental of \$600 a day, and was refitted for the army transport service at a cost of \$4,300. She is 350 feet in length by 43 feet in breadth, and has a net tonnage of 2,561. Her speed is not reported. Fire drill is held only at each port. Her ventilating system is not modern and is unsatisfactory. She is reported as seaworthy. The inspector says:

She is not desirable as a troop ship, has not enough deck space for the number of troops carried, and is very poorly ventilated.

Kintuck. No details concerning the history, cost, dimensions, etc., of the United States chartered transport *Kintuck* are given in the report received. So far as reported, she appears to be in a generally good and satisfactory condition.

Leelanaw. The *Leelanaw* is a steel vessel, 14 years old, which was chartered by the United States at a daily rental of \$475. She was refitted for service as an army transport at a cost of \$5,222.76. She is 280 feet in length by 36 feet 3 inches in breadth, and has a net tonnage of 1,496 and an average speed of 9.4 knots. Her scuppers discharge directly overboard. No refrigerating plant, and no cold storage facilities except two ice boxes; no searchlight; no regular hospital; no prison room, and no treasure chamber. She had been recently repaired at a cost of \$5,000, and was in good condition generally. She had padded-stall accommodations for 262 animals, but the arrangement of all the stalls was not satisfactory. The inspector remarks:

This ship has been very successful in the transportation of animals.

Lennox. The *Lennox* is a steel vessel, 5 years old, which was chartered by the United States at a rental of \$700 a day. The cost of refitting and repairing her for service as an army transport, if any, is not reported. Her dimensions are not stated, but she has a net tonnage of 2,361 and an average speed of 10 knots. No hospital. She had stall accommodations for 456 animals, and was in good general condition.

Ohio. The *Ohio* is 28 years old, and the material of which she is constructed is not stated. She was chartered by the United States at a rental of \$600 a day, and \$16,000 was expended in refitting her for service as an army transport. She is 350 feet in length by 43 feet in breadth, and has a net tonnage of 2,072 and an average speed of 10 knots. The quarters for the crew are not well arranged. No laundrying facilities. Her general condition was good. The inspector says:

This vessel is only fairly well adapted for transport service.

Oopack. The *Oopack* is a steel vessel, 5 years old, which was chartered by the United States Government at a daily rental of \$600, and was refitted for the army transport service at a cost of \$30,000. She is 385 feet in length by 45 feet 3 inches in breadth. Her net tonnage is 2,517 and her average speed is 11 knots. The ship is ventilated by fans, and the system is pronounced "not a success." No regular hospital. The vessel was in good condition generally. She has stall accommodations for 750 animals, and the stalls are badly arranged, but substantially made.

Pakling. The *Pakling* is a steel vessel, 6 years old, which was chartered by the United States Government at a rental of \$600 a day. The sum of \$36,000 was expended in refitting her for the army transport service. She is 435 feet in length by 48 feet in breadth, and has a net tonnage of 2,875 and an average speed of 12½ knots. She has the forced-air system of ventilation, with electric fans and air ports, and it is reported as unsatisfactory. No regular hospital. She has stall accommodations for 921 animals, which, it is stated, are mostly very unsatisfactory. The inspector remarks:

This is a large, fine ship, with good beams, and if properly fitted out ought to be satisfactory for a horse transport.

Pennsylvania. The *Pennsylvania* is an iron vessel, 29 years old, which was chartered by the United States at a daily rental of \$600, and was refitted for service as an army transport at an expense \$11,000. She is 355 feet in length by 43 feet in breadth, and has a net tonnage of 2,567 and an average speed of 10 knots. She was reported as in seaworthy condition. The inspector says:

The cargo space is small, and for the number of troops she can carry she is doubtless an expensive transport.

The reports received during the year do not give any details as to the history, dimensions, cost, etc., of the United States chartered transports *Petrarch*, *Port Albert*, and *Port Stephens*. So far as reported they were all in generally good condition. The *Petrarch* had no bathing or laundry facilities. The *Port Albert* had stall accommodations for 505 animals, and the *Port Stephens* for 465.

Siam. The reports do not give details of the history, etc., of the *Siam*, but she was chartered by the United States Government at a daily rental of \$450, and there is no account as to whether there was a further expenditure in fitting the vessel for the transport service. Her general condition was found satisfactory. The vessel is equipped to meet the requirements of a freight ship only.

Strathgyle. The *Strathgyle* is a steam vessel, 7 years old, and was chartered by the United States at a daily rental of \$600. She was refitted for service as an army transport at a cost of \$44,000. She is 412 feet in length by 48 feet in breadth, and has a net tonnage of 3,284 and an average speed of 10 knots. Some of her scuppers discharge in the bilges. Fire drill is not had regularly. The vessel is ventilated by the blower system, which is pronounced unsatisfactory. She has no regular hospital. She was found in excellent general condition. She has accommodations for 750 animals. The stalls are well built and padded, but not sufficiently ventilated. The inspector says:

The ventilating system should be improved.

Thyra. The *Thyra* is a steel vessel, 2 years old, which was chartered by the United States at a rental of \$400 a day, and there is no account of any expenditure that was made in fitting her for the transport service. She is 250 feet in length by 48 feet in breadth, and has a net tonnage of 2,420. Her rate of speed is not stated. She has no searchlight and no regular hospital. She was found in good general condition. She has accommodations for 550 animals. This vessel is equipped for the transportation of freight and animals. The inspector says that it is "only fairly well adapted for the transport service."

Westminster. The *Westminster* is a steel vessel, 11 years old, which was chartered by the United States at a daily rental of \$450, and was refitted for the service as an army transport at an expense of \$53,000. She is 390 feet in length by 45 feet 5 inches in breadth, and has a net tonnage of 2,510 and an average speed of 10½ knots. She is a freight ship only. Her general condition was good.

Wyefield. The *Wyefield* is a steel vessel, 3 years old, that now carries freight only, and was chartered by the United States, which pays \$6 per ton for freight carried on public account by

this vessel. She is 340 feet in length by 46 feet in breadth, and has a net tonnage of 2,088. Her rate of speed is not given. She was in seaworthy condition.

Flintshire. The history of the *Flintshire* is not given in the report of inspection. The quarters for troops were found very poor and inadequate, messing facilities for officers very poor; only one range for cooking for troops, and rations not conveniently stored. The inspector reported:

The *Flintshire* is not suited for carrying troops.

Data from transport inspection reports.

Number.	Name.	Where inspected.	Date of last inspection.	By whom inspected.	Between what ports plying.	Cost.		
						Original cost.	Cost of fitting up.	Cost of repairs since purchase.
United States trans- ports.								
1	Buford	San Francisco, Cal.	Mar. 23, 1901	Lieut. Col. M. P. Maus, I. G. V.	Manila-San Francisco.	(1)	\$400,000.00	
2	Burnside	Manila, P. I.	June 27, 1901	Capt. G. L. Byram, 6th Cav., A. I. G.	Manila-Hongkong			
3	Cook	Havana, Cuba	Nov. 7, 1900	Col. G. H. Burton, I. G.	New York-Habana			
4	Cyrus Wakefield.	San Francisco, Cal.	Sept. 25, 1900	Lieut. Col. M. P. Maus, I. G. V.	San Francisco-Manila.	\$45,000		
5	Egbert.	do	May 11, 1901	do	San Francisco-Taku, China.	200,000		
6	Grant.	do	June 8, 1901	Capt. G. L. Byram, 6th Cav., A. I. G.	San Francisco-Manila.	680,000		
7	Hancock	do	June 24, 1901	Lieut. Col. M. P. Maus, I. G. V.	do	600,000	460,000.00	
8	Kilpatrick.	Manila, P. I.	June 4, 1901	Capt. G. L. Byram, 6th Cav., A. I. G.	do	(2)	\$135,650.00	
9	Lawton	do	June 24, 1901	do	do			
10	Logan	do	May 13, 1901	do	do			
11	McClellan	New York, N. Y.	May 29, 1901	Capt. E. D. Hoyle, A. C., asst. to I. G.	New York-Habana.	175,000		
12	McPherson	do	Jan. 26, 1901	do	do	250,000		
13	Meade	Manila, P. I.	Jan. 18, 1901	Capt. G. L. Byram, 6th Cav., A. I. G.	San Francisco-Manila.	400,000	250,000.00	
14	Rawlins	New York, N. Y.	Feb. 5, 1901	Capt. E. D. Hoyle, A. C., asst. to I. G.	New York-Habana.			
15	Relief	Manila, P. I.	Jan. 30, 1901	Maj. D. E. Nolon, 11th Cav., A. I. G.	New York-Manila.			
16	Rosecrans	do	Feb. 9, 1901	Maj. L. A. Lovering, 30th Inf., A. I. G.	San Francisco-Manila.			
17	Semmes	San Francisco, Cal.	May 11, 1901	Lieut. Col. M. P. Maus, I. G. V.	do	425,000		\$457,275
18	Sedgewick	New York, N. Y.	June 7, 1901	Capt. E. D. Hoyle, A. C., asst. to I. G.	New York-Habana.	200,000		
19	Sheridan	Manila, P. I.	June 29, 1901	Capt. G. L. Byram, 6th Cav., A. I. G.	San Francisco-Manila.	660,000	320,000	
20	Sherman	do	Dec. 15, 1900	Lieut. Col. S. C. Mills, I. G.	do	184,000	650,000.00	918,000
21	Sumner	do	June 6, 1901	Capt. G. L. Byram, 6th Cav., A. I. G.	do	680,000		
22	Thomas	do	May 27, 1901	Lieut. Col. M. P. Maus, I. G. V.	do	200,000	148,194.00	542,835
23	Warren	San Francisco, Cal.	May 11, 1901	do	do	Unknown.	Unknown.	
24	Wlocum (tug).	do	Jan. 14, 1901	do	Equipped for harbor service only.			
Chartered.								
25	Algoa	San Francisco, Cal.	Sept. 25, 1900	Lieut. Col. M. P. Maus, I. G. V.	San Francisco-Manila.	Rental per day.		
26	Arab	do	Mar. 24, 1901	do	do	\$750		
27	Athenian.	Manila, P. I.	Sept. 25, 1900	Lieut. Col. S. C. Mills, I. G.	do	600	35,000.00	
28	Artec.	San Francisco, Cal.	Apr. 6, 1901	Lieut. Col. T. W. Jones, 46th Inf., U. S. A., in office of I. G.	do	450		
					do	500	30,000.00	
29	Belgian King.	do	Aug. 21, 1900	Lieut. Col. M. P. Maus, I. G. V.	do	600	28,000.00	
30	Californian.	Manila, P. I.	Sept. 6, 1900	Maj. L. A. Lovering, A. I. G.	do	600		
31	Conemaugh	San Francisco, Cal.	Oct. 6, 1900	Capt. A. B. Dyer, 6th Art., A. I. G.	do			
32	Federica	do	Aug. 30, 1900	Lieut. Col. M. P. Maus, I. G. V.	do	550	45,000.00	
33	Garonne.	Manila, P. I.	Mar. 8, 1901	Maj. L. A. Lovering, A. I. G.	do			
34	Indiana	do	June 21, 1901	Capt. G. L. Byram, 6th Cav., A. I. G.	do	600	4,300.00	
35	Kintuck	do	May 27, 1901	do	do			

Number.	Name.	Age.	Speed per hour.			Material.	Length.	Breadth.	Tonnage.		Mean draft.		Ballast carried.
			Maxi- mum.	Aver- age.	Eco- nom- ical.				Gross.	Net.	Loaded.	Light.	
		Years.	Knots.	Knots.	Knots.		Fed.	Fed.	Tons.	Tons.	Fed.	Fed.	
<i>United States trans- ports.</i>													
26	Leelanaw	San Francisco, Cal.	11	11	10	Steel	380	44	3,700	2,534	22	17	475
27	Lennox	Manila, P. I.	9	11	10	Steel	294	36½	4,126	1,405	21	14	700
28	Ohio	San Francisco, Cal.	8	13½	11	Iron	485	43½	2,119	2,703	24	19	16,000.00
29	Copeck	Manila, P. I.	19	11	10	Wood	247	39½	2,845	1,941	24	19	600
30	Faking	do	12	10½	11	Steel	332	39½	2,845	1,941	24	19	600
31	Pennsylvania	San Francisco, Cal.	19	13	11	Iron	445	49	5,580	3,604	24	23	30,000.00
40	do	do	22	15½	11	Iron	475	45½	6,000	2,657	24	23	600
41	Pennsylvania	Manila, P. I.	11	11½	11	Steel	370	44	3,721	2,383	24	16½	600
42	Pennsylvania	Manila, P. I.	12	11½	11	Steel	250	43½	3,486	2,382	19	13	11,000.00
43	Fort Albert	do	12	11½	12	Iron	445	49	5,580	4,407	26	21	460
44	Fort Stephens	do	16	12	11	Steel	336	39½	3,500	1,828	21	16½	44,000.00
45	Strathgyle	San Francisco, Cal.	21	15	12	Steel	420	39½	3,699	2,277	24	16½	400
46	Thyra	Manila, P. I.	27	16	14	Steel	510	44	5,641	3,375	28	26	400
47	Worminster	San Francisco, Cal.	27	15	13½	Steel	299½	40	2,488	2,126	20	16½	68,000.00
48	Wyntfield	do	5	12	11	Steel	313	46	3,084	1,947	17	12	46
49	Wyntfield	Manila, P. I.	18	10½	11	Steel	345	38½	2,976	1,816	23½	13	170 tons shindia, 150 tons tin and lead, 80 tons water.
50	Flintshire	Manila, P. I.	26	14	14	Steel	465	52	4,727	4,507	24½	20½	460
			15½	14	14	Steel	461	44	4,727	4,507	26	20½	44,000.00
			13	12	11½	Steel	462	49	5,680	3,604	27	19	600
			14	13½	11	Steel	365	43	6,780	3,725	24	17	800 tons of iron, 1,055 tons water.
			7	13	10½	Steel	460	50	7,163.55	2,182	24	16	418 tons water, 418 tons pig iron.
			12	13	11	Steel	380	43	4,375	2,925	24	16½	1,000 tons pig iron.
			3	11	11	Steel	165	29	4,581	337	24	16½	Slag.

* For Army service.

* Bought by Navy Department.

† Captured, 1898.

Data from transport inspection reports—Continued.

Number.	Name.	Age.	Speed per hour.		Material.	Length.	Breadth.	Tonnage.		Mean draft.		Ballast carried.
			Maxi- mum.	Aver- age.				Gross.	Net.	Loaded.	Light.	
	Chartered.	Years.	Knots.	Knots.		Feet.	Feet.	Tons.	Tons.	Feet.	Feet.	
25	Algera	5	14	11	Steel	476	56	7,574	4,896	24	11	846 tons water.
26	Arab	11	12	10	Steel	388	46½	4,216	2,674	24½	12	290 tons water.
27	Athenian	7	12	10	Iron	370	43	4,000	2,439	25	9	608 tons water.
28	Aztec	7	10	9	Iron	382	41	3,500	2,298	26	16	600 tons water.
29	Belgian King	2	10	9	Steel	485	51	3,378	2,170	26	16	1,638 tons water.
30	California	2	10	10	Steel	360	46	5,600	2,313	22½	12	861 tons water.
31	Federica	28	9½	9½	Iron	350	43	3,385	2,561	22½	12	300 tons pig iron.
32	Indiana	14	9½	9	Steel	280	36½	1,923	1,496	23	12½	600 tons water.
33	Leelanaw	5	10	10	Steel	350	43	3,676	2,361	25	19	500 tons pig iron and water.
34	Lennox	28	10	11	Steel	385	45½	3,488	2,517	24½	9½	800 tons water.
35	Ohio	5	11	11	Steel	485	48	4,447	2,875	25	15	1,260 tons water.
36	Oopack	6	12½	12½	Steel	385	43	3,343	2,567	27½	15	150 tons pig iron.
37	Pakistan	29	10	10	Iron	412	48	5,023	3,294	24½	15	1,850 tons water.
38	Pennsylvania	7	10	9	Steel	250	48	3,742	2,420	23	14	817 tons water.
39	Strathgyle	2	10½	10	Steel	390	42½	3,859	2,510	23½	15	1,200 tons water.
40	Thyra	11	10½	10	Steel	340	46	3,295	2,098	22½	15	Water ballast.
41	Westminster	3			Steel	340	46	3,295	2,098			
42	Wyfield				Steel	340	46	3,295	2,098			

Number.	Name.	Sails.	Steering apparatus.	Armament.	Gangways.	Life-saving apparatus.
United States trans-ports.						
1	Buford	Six	Good	3 6-pdr. Driggs Sea-bury R. F. guns; condition good. Cable boat.	1 lacking	1 steam launch, 10 lifeboats, 2 small boats, 6 rafts, and 1,694 life-preservers; condition good.
2	Burnside	None				6 lifeboats, 2 life rafts, 12 Franklin buoys, 2 ordinary boats, 428 life-preservers; generally bad.
3	Cook	do.	Very rusty in parts.	None		1 steam launch, 11 lifeboats, 4 rafts, 6 buoys, 1,300 life-preservers; good.
4	Cyrus Wakefield	do.	Steam and hand ap- paratus.	do		Supplied according to regulations.
5	Egbert	do.	Steam and hand ap- paratus.	do		2 steam launches, 4 lifeboats; good, except 200 life-preservers.
6	Grant	Five	Steam	1 6-pdr. R. F. gun.		1 steam launch, 2 lifeboats, 2 small boats, 10 life rafts, 2,000 life-preservers; all in good condition.

7	Hancock	Steadying	.....do	4 6-pdr. R. F. guns.	All necessary.	1 steam launch, 9 lifeboats, 6 life rafts, 20 life buoys, 1,500 life-preservers; good and sufficient.
8	Kilpatrick	None	In good condition	None	.....	8 lifeboats, 2 life rafts, 12 life buoys, 1,008 life-preservers; in good condition.
9	Lawton	Five	Steam and hand	None	.....	1 steam launch, 8 lifeboats, 9 life rafts, 12 life buoys, 600 life-preservers.
10	Logan	None	Steam gear	None	.....	12 boats, 10 rafts, 12 life buoys, 2,000 life-preservers; condition good.
11	McClellan	Five	Steam, new, excellent and satisfactory.	None	.....	Steam launch, lifeboats, rafts, etc.; good; insufficient.
12	McPherson	Six	In fair condition	None	.....	Steam launch, lifeboats, life rafts, life buoys, life-preservers; all in good condition.
13	Muede	Steadying	Steam	4 6-pdr. guns.	.....	Steam launch, life boats, life rafts, and life-preservers; all adequate and in good condition.
14	Rawlins	Four	In good condition	None	.....	Steam launch, out of order; life boats and rafts, good, life-preservers, good; insufficient.
15	Relief	Steadying	.....do	None	.....	Steam launch, life boats, rafts, buoys, and preservers; generally in good condition.
16	Rosecrans	Yes	Steam and hand	None	Yes	Steam launch, life boats, rafts, buoys, and preservers; generally in good condition.
17	Samoa	Four	Steam	None	.....	None reported.
18	Sedgwick	Five	In good condition	None	.....	Steam launch, life boats, life rafts and buoys, and life-preservers; in good condition.
19	Sheridan	Yes	Steam and hand	None	.....	Steam launch, life boats, rafts, buoys, and preservers; generally in good condition.
20	Sherman	.....do	Steam	4 6-pdrs.	.....	Steam launch, life boats, rafts, buoys, and preservers; all in good condition.
21	Sumner	.....	Steam and hand	3 6-pdrs.	.....	Steam launch, life boats, rafts, buoys, and preservers; all in good condition.
22	Thomas	None	Steam	4 6-pdrs.	.....	2 steam launches, life boats, rafts, buoys, and preservers; adequate and in good condition.
23	Warren	Steadying	Steam and hand	.....do	.....	Steam launch, life boats, buoys, gis, and preservers; adequate and in good condition.
24	Slocum (tug)	Two	.....do	None	.....	2 lifeboats, 30 preservers; good.
<i>Chartered.</i>						
25	Algoa	Two	.....do	.....do	.....	Life boats, buoys, and preservers; good.
26	Arab	Four	.....do	.....do	.....	Life boats, buoys, and preservers; good.
27	Aztec	Five	Steam and hand	.....do	.....	Life boats, rafts, buoys, and preservers; good.
28	Belgian King	Steadying	.....do	None	.....	Life buoys and preservers.
29	Californian	.....do	Steam	.....do	.....	Life boats, rafts, buoys, and preservers.
30	Federica	Steadying	Steam and hand	.....do	.....	Life boats, rafts, buoys, and preservers.
32	Indiana	.....do	Steam	.....do	.....	Life boats, rafts, buoys, and preservers.
34	Leclana	Yes	Steam and hand	.....do	.....	Life boats, rafts, buoys, and preservers.
36	Lennox	Steadying	.....do	None	.....	Life boats, rafts, buoys, and preservers; good.
37	Lennox	Steadying	.....do	None	.....	Life boats, rafts, buoys, and preservers; good.
38	Ohio	Yes	Steam and hand	.....do	.....	Do.
39	Oopack	Six	.....do	.....do	.....	Do.
40	Peking	Yes	.....do	.....do	.....	Life boats, buoys, and preservers; good.
41	Pennsylvania	.....do	.....do	.....do	.....	Life boats, rafts, and preservers; good.
42	Pennsylvania	.....do	.....do	.....do	.....	Life boats, rafts, and preservers; good.
43	Siam	.....do	.....do	.....do	.....	Life boats, buoys, and preservers; good.
44	Strathgyle	Yes	Steam and hand	.....do	.....	Life boats, buoys, and preservers; good.
45	Thyra	.....do	.....do	.....do	.....	Life boats, buoys, and preservers; good.
46	Thyra	.....do	.....do	.....do	.....	Life boats, buoys, and preservers; good.
47	Westminster	.....do	.....do	.....do	.....	Do.
48	Westminster	.....do	.....do	.....do	.....	Life boats, buoys, and preservers.
49	Wyfield	.....do	.....do	.....do	.....	Life boats, buoys, and preservers.

Data from transport inspection reports—Continued.

				Quarters.							
Companion ladders.	Towing hawsers.	Anchors.	Chronometers.	Compasses.	Awnings.	Scuppers.	Cabins.				
							Num-ber.	Capac-ity.	Condition.	Air space.	Over-crowding reported.	Permanent assignment of staterooms.
1 All necessary.	1 towing & mooring.	7	3	Proper supply.	Complete.	Discharge below water line. Too small.	80	56	Good		Criticised.
2			Proper assortment.	Proper assortment.	do.						
3	1	6	3	3	Complete set.						
4			2	Yes	Full supply.						
5	1	6	3	Yes	Complete set.			18			
6	2	7	3	Yes	Complete set.			73			
7 All necessary.	1	7	2	Yes	Complete set.			54			
8	1	9	2	3		All do not discharge below water line.	7	14			
9	1	6	3	Yes	Sufficient.				43	Good	
10	Proper supply.	Proper supply.	Proper assortment.	Proper assortment.	Complete double set.	Discharge below water line.	40	81	do.		
11	1	5	3	3	Full set.	do	26	60	Very good.		
12 Plenty.	2	6	3	4	Complete set.	do	86	72			
13	Adequate.	10	4	3	Complete set.	do	29	58	Excellent		
14	1	5	3	2	Full set.	Discharge below water line.	9	18	Badly arranged	Too small.	
16	None	Proper supply.	Proper supply.	Proper supply.	Proper supply.				Carried no troops or passengers; fitted for freight only.		
17									Good		
18	1	5	2	4	Complete set.	Discharge below water line.	80	60	Good		
19	1	Yes	3	Yes			98	186			Some complaint.
20	2	6	4	Yes	Complete set.		82	63	Good		
21	2	6	3	Yes	do		82	60	Comfortable		
22	4	7	Yes	Yes	do		85	69	Good		
23	1	6	3	Yes	do	Discharge into bilges.	20	50	do.	Yes	
24	2	2	1	Yes	do		8		do.		
26	3	4	3	Yes	Complete set.	Discharge into bilges.	4	8	Suitable		

No.	Quarters.										Bunks, hammocks.				For crew.	Heating satisfactory.
	Troop decks.										Bunks, hammocks.					
	Capacity.	Condition.	Air space.	Overcrowding reported.	Maximum.	Average.	Bunks, hammocks, or standees.	Condition.	Sufficiency.							
1	1,005	Excellent.	Not up to legal requirements.	Deck space limited.	962		Iron standees with canvas bottoms, 1,020 hammocks.	Satisfactory	Sufficient.		Overcrowded and unsatisfactory.	Yes.				
2					26											
3		Good			800											
4	100				118											
5	1,830				1,903											
6					1,133											
7	1,062		Well ventilated.	Slightly encumbered.	1,103											
8	1,050				1,701											
9					310											
10	1,620				566											
11	250				1,331											
12	1		Not well ventilated.													
13	1,271															

Data from transport inspection reports—Continued.

Quarters.				Number of pas- sengers.	Bunks, hammocks.			For crew.	Heating satisfactory.
Capacity.	Condition.	Air space.	Overcrowding reported.		Maxi- mum.	Aver- age.	Condition.			Sufficiency.
Troop decks.									
14	375	Ample.			428			Berthed between decks.	Insufficient.
16	606				624				
17									
18	1,000	(1)			1,060			Sufficient.	Steam heat.
19	1,842				2,028		Hammocks and standees.		
20	1,782	Insufficient.			1,845		Bunks		Do.
21	957	Yes.			1,017		Bunks		Do.
22	1,654	80 cubic feet per man.			1,723		do.		Heated by hot air.
23	1,256	Unsatisfac- tory.	Insufficient.		1,306		Turner bunks	Good	Steam heat.
24								Sufficient.	None for troop deck.
26	70	Good			78		Bunks		Quarters too cir- cumscripted.
27					122				Steam heat.
28									Do.
29	147		Not well ven- tilated.		169				Do.
30									Do.
31									
32	81								
33	54	Plenty.			64		Ample	Ample	
34	906		Yes.		947		Bunks for all.		
35	819				878				Do.
36	135	100 cubic feet.			191				
37	35				77				
38	72								
39	765				805			Not well arranged	Do.
40									Steam heat; adequate.
41	1,100				1,130		110 bunks. Woven-wire bunks.		Adequate.
46	96	Good			100				Steam heat.
47									Do.
48									Do.
49			Very poor						Do.
50									

¹ Except for short voyage in mild weather, this ship would be uncomfortable for troops.

Data from transport inspection reports—Continued.

Fire apparatus.			Fire drill.	Water supply.					Engineer department.		
Condition.	Sufficiency.			Capacity of tanks.	Condition of tanks.	Sufficiency.	Quality of water.	Distilling apparatus.	Kind.	Condition.	Sufficiency.
								Capacity.			
1	Good.	Sufficient.	Once a week.	800 tons.		For 25 days.	Good.	10,000 galls. daily.	Triple expansion.	Good.	Proper supply.
2	do.	do.	Regularly.				Satisfactory.		do.	Not good.	Insufficient.
3	do.	do.	Once a week.	168,000 galls.		30 days.		20,000 galls. daily.	Tandem compound.	Old, obsolete.	
5	Good.	Adequate.	Regularly.	500 tons.					Triple expansion.	Good.	
6	do.	do.	Weekly.	275 tons.					do.	do.	
7	do.	do.	do.	34,000 galls.					do.	do.	
8	Good.	Adequate.	Every voyage.	181,888 galls.					do.	Good.	
9	do.	Adequate.	do.	4 tanks, 15,000 galls.					do.	do.	
10	do.	All necessary.	Regular.			20 days.	Good.	5 galls. per minute.	do.	do.	Yes.
11	do.	Very satisfactory.	Once a week.	455 tons.				2,000 galls. daily.	do.	do.	Excellent.
12	do.	do.	Every Sunday.	20,000 galls.		20 days.		3,500 galls. daily.	do.	do.	Good.
13	do.	Sufficient.	Weekly at sea.	60,000 galls.		20 days.	Satisfactory.	3,000 galls. daily.	do.	do.	do.
14	do.	do.	Weekly.	114 tons.		21 days.	Satisfactory.	do.	Proper.	do.	do.
15	do.	do.	Regular.	120 tons.			do.	50 galls. per hour.	do.	do.	do.
16	do.	do.	do.	2,100 tons.				10,000 galls. daily.	Triple expansion.	Fair.	do.
17	Fair.	Sufficient.	Weekly.	19,000 galls.		10 days.			Vertical compound.	Good.	do.
18	Adequate.	do.	do.	2,229 tons.			Satisfactory.	17 tons a day.	Triple expansion.	Satisfactory.	do.
19	Adequate.	do.	do.	1,200 tons.					do.	do.	do.
20	Good.	Sufficient.	do.						Compound.	Good.	do.
21	do.	Insufficient.		112,666 galls. and 400 tons ballast.			Satisfactory.				
22	do.	Adequate.	Weekly.	1,209 tons.					Triple expansion.	do.	do.
23	do.	do.	do.	800 tons.	Good.				do.	do.	do.
24	do.	do.	do.	42,000 galls.				2,000 galls. daily.	do.	do.	do.
25	do.	do.	do.	25 tons and ballast.					do.	do.	do.
26	Good.	Adequate.			1 bad.			4,000 galls. daily.		do.	do.
27				530 tons.	Good.		Good and fresh.	5,000 galls. daily.	Triple expansion.	do.	do.
28	Good.	Adequate.		606 tons.							

[illegible]

Data from transport inspection reports—Continued.

Ventilation.			Messing, etc.					Cooking facilities.	
Apparatus.	Condition and sufficiency.	Wind sails.	Quality of food.	Average cost per saloon passenger per day.	Messing facilities satisfactory.	Crew.	Cooking character of.	Condition.	Sufficiency.
1 Sturtevant, hot and cold air	Good condition and adequate.	Yes	Good	\$1.00	Inadequate for carrying capacity.	Yes	Good	Excellent	Sufficient.
2 2 steam and 2 electric exhaust fans.			do		Yes	Yes	Satisfactory	Good	Adequate. Do.
3 Portholes and natural draft.	Insufficient.		Excellent	1.00	Good	Good		Good	Sufficient.
5 Force-air system			Good	1.00	Inadequate.	Yes	Good	Good	Do.
6 do	Excellent		do	1.00	Good	Good	do	do	Do.
7 No ventilating apparatus			Good	1.00	Yes	Yes	Good	Good	Do.
8 Ventilation is not modern			do	1.00	Good	Good	do	do	Do.
9 Metallic ducts.	Insufficient.		Good	1.00	do	Yes	Good	Good	Sufficient.
10 No ventilating plant for troop decks.					Yes	do	Excellent	Good	Sufficient.
11 Sturtevant system, etc.	Cooling tanks not satisfactory.				do	do		do	Do.
12 Sturtevant system.	Well ventilated.		Excellent	1.00	do	do	Good	Satisfactory	Adequate.
13 McReedy system	Satisfactory		do	.75	do	do	Good	Good	Sufficient.
14 No mechanical ventilating apparatus.					do	do		do	Ample.
15 Deck ventilators and small electric fans.	Not sufficient.		Good		do	No.		do	
17 Cowl ventilators from deck			Satisfactory	1.00	Yes	Yes	Good	Good	Sufficient.
18 Sturtevant system.			do		do	do	do	do	Do.
19 Sturtevant fan system.			do		do	do	Satisfactory	do	Do.
20 Sturtevant system.	Adequate		do	1.00	do	do	do	do	Do.
21 Hot and cold air	Good		do	1.00	do	do	do	do	Do.
22 McCreary system.	Good and adequate		do		Crowded	do	do	do	Do.
23 Air ports and electric fans	do.		do		Yes	Yes	do	do	Do.
24 Forced air, deck ventilation, and air ports.	Not altogether satisfactory.	Yes		1.00	do		do	do	Adequate.
26 Exhaust system	Not entirely satisfactory and adequate.	do	Good	1.00	Yes				
27 By motor fans.			Good	1.00	do				
28			Good		do	Yes	Good	Good	Good.
29 Air ports and motor fans			Good		do	Yes	Good	Good	Ample.
30 National system.			Good		Yes	Yes	Good	Good	
31			Good		Yes	Yes	Good	Good	

	Messing, etc.			Refrigerating apparatus.				Cold storage, etc.					Do.	
	Bakery.			Process.	Condition.	Sufficiency.	Capacity.	Condition.	Sufficiency.	Temperature.	Separate cold-storage capacity.			
	Condition.	Capacity.	Sufficiency.											
22	Air tubes and fans		Not satisfactory											
23	Not modern		Adequate											
24	Fan and blower system													
25	Electric blower fan													
26	Electric blower fan													
27	Ventilation by fans		Not a success											
28	Forced-air system, electric fans, air ports.		Not satisfactory											
41			Good											
42			do											
43			Not satisfactory											
44	Blower system													
45	Fans and portholes													
46														
47														
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Hospital.											Plumbing.
Isolation ward.		Operating room.		Diet kitchen.		Sick.		Deaths during voyage.		Hospital corps.	
Condition.	Capacity.	Suitability.	Suitability.	Properly equipped.	Condition.	Properly equipped.	Sick.	Deaths during voyage.	Hospital corps.		
1	Excellent	4 beds	Excellent	Suitable	Yes	Excellent	Yes	6 average daily.	3	3	Reported bad by surgeon and criticized by chief surgeon.
2											
3	Good	6 beds		None						2	
4		No isolation ward.		None						1	
5	No isolation ward.									12	
6	8 beds					Yes	do.			6	
7	No isolation ward.						do.			1	
1					Excellent						
No detention ward.											

Hospital.											Plumbing.
Isolation ward.		Operating room.		Diet kitchen.		Sick.		Deaths during voyage.		Hospital corps.	
Condition.	Capacity.	Suitability.	Suitability.	Properly equipped.	Condition.	Properly equipped.	Sick.	Deaths during voyage.	Hospital corps.		
11	Ice is not manufactured										
12	do.										
13	1,000 pounds daily; good										
14	Ice is not manufactured										
15	1,000 pounds daily										
16	No ice manufactured										
17											
18											
19	1,000 pounds daily; good										
20	do.										
21	Good										
22	do.										
23	1,000 pounds daily; good										
24											
25											
26											
27	140 pounds daily										
28	No ice machine										
29											
30	No ice machine										
31	Good										
32											
33											
34											
35											
36											
37											
38											
39											
40											
41											
42											
43											
44											
45											
46											
47											

Hospital.											Plumbing.
Isolation ward.		Operating room.		Diet kitchen.		Sick.		Deaths during voyage.		Hospital corps.	
Condition.	Capacity.	Suitability.	Suitability.	Properly equipped.	Condition.	Properly equipped.	Sick.	Deaths during voyage.	Hospital corps.		
1	Excellent	4 beds	Excellent	Suitable	Yes	Excellent	Yes	6 average daily.	3	3	Reported bad by surgeon and criticized by chief surgeon.
2											
3	Good	6 beds		None						2	
4		No isolation ward.		None						1	
5	No isolation ward.									12	
6	8 beds					Yes	do.			6	
7	No isolation ward.						do.			8	
1											
No detention ward.											

1 No detention ward.

Data from transport inspection reports—Continued.

Employees.										Supplies—				Log.
Deck department.	Engi- neer's de- part- ment.	Steward's depart- ment.	Other employ- ees.	Aggre- gate.	Crews, etc.		Quartermas- ter's.	Subsistence.	Medical.	Lyle gun.				
					Excessive in num- ber or cost.	Satisfactory.								
1	46	56	38	135	Yes; in steward's department.	Yes	Canvas bot- toms of bunks ma- terial too light.	Quality good				Properly kept.		
2	187	23	26	86		Excellent		do	Sufficient			Do.		
3	45	55	36	136	Sufficient.	Yes			Plenty			Do.		
4					Yes; in steward's department.	do			Good supply	Yes		Regularly kept.		
5	31	36	23	50	Full complement.	do			Full supply	do		Do.		
6	50	63	55	168	Sufficient.	do	Good supply	Good supply	do	do		Do.		
7	49	70	28	147	Full complement.	do	Proper supply	Proper supply	do	do		Do.		
8						Yes	Good	Good	do	Yes		Properly kept.		
9	34	34	38	99		do	do	do	do	Properly written		up.		
10	43	66	43	152		do						Properly written		
11	40	40	33	113		do			Ample	Yes		Properly kept.		
12	36	41	21	97		do			Full supply	do		Properly written		
13	54	70	44	168		do			do	do		up.		
14	40	36	26	102		Yes	Ample and good.	Ample and good	do	do		Do.		
15	31	47		116			Good	Good	do	Do.		Do.		
16	32	29	26	87		do			Interior	do.		Do.		
17	26	37	12	75		Discipline not satisfactory.			All necessary	do.		Do.		
18	40	57	37	144		Efficient			Ample supply	Yes		Do.		
19												Do.		
20	52	66	56	174		do			Full supply	do		Do.		
21	50	65	49	164		do			do	do		Do.		
22	45	42	43	130		do			do	do		Do.		
23	50	67	47	167		do			Good supply	do		Do.		
24	41	57	40	138		do	Good supply	Good supply	Full supply	do		Do.		
25	9	8	3	20	In number	do				do		Do.		
26												Properly kept.		
27	25	31	9	65		Efficient						Regularly kept		
28				109		do				Yes		Do.		
29	14	22	10	46		do				do		Do.		
30	16	20	13	49		do				do		Do.		
31	15	25	6	46		do				do		Do.		
31 ¹									Full supply			Do.		
31 ²						Efficient						Full crew.		
32	9	18	3	30	Total monthly pay, \$1,486; average \$40.13.	* Hospital.	* Crew satisfactory and sufficient.							

¹ Total monthly pay, \$1,486; average \$40.13.

² Crew satisfactory and sufficient.

³ Hospital.

Data from transport inspection reports—Continued.

Employees.					Supplies—				Log.
Deck department.	Engl. Steward's department.	Other employees.	Aggregate.	Excessive in number or cost.	Crews, etc.	Quartermaster's.	Subsistence.	Medical.	
33								Some instruments lacking.	
34	31	30	100		Efficient.			Good supply	Regularly kept.
35	14	6	40		do			do	Do.
36	18	29	80		do			do	Do.
37	26	5	53		do			do	Do.
38	22	29	66		do			do	Do.
39	24	13	68		do			do	Do.
40	24	29	99		do			do	Do.
41	31	29						Proper supply.	Do.
42		167							Do.
43									Do.
44									Do.
45									Do.
46	17	19	39		Efficient.			Good supply	Properly kept.
47	17	39	46		do			do	Do.
48									Do.
49	16	8	42		Efficient.				Regularly kept.

Bathing and toilet.									
Bathing facilities.				Water closets and urinals.					
Kind.	Condition.	Sufficiency.	Hospital adequacy.	Condition.	Sufficiency.	Arrangement satisfactory.	Latrine, no.	Condition.	Basins sufficient.
1 9 bath tubs, 11 shower baths.	Excellent		Sufficient.	Excellent	Sufficient			Excellent	85
2 Ample for officers and passengers, shower baths and wash basins for crew.	Good	Ample.	Ample.		Insufficient.	Not all.		Good	Yes.
3 6 bath tubs, 2 shower baths.	Very good			Good	8 closets			do	10
4 3 bath tubs, 14 shower baths.	Good			Good	82 closets			do	84
5 9 bath tubs, 22 shower baths, 84 basins.	do			do	Ample			do	10
6 No shower baths.	Excellent	Ample.		do	9 closets			do	100
7 2 bath tubs, 9 shower baths.	Satisfactory	Satisfactory	Satisfactory	Satisfactory	Satisfactory	Yes		Satisfactory	9
8 3 bath tubs, 15 shower baths.	Good			Good	do			do	65
9 4 shower baths.	do			do	do			do	8
10 6 bath tubs, 18 shower baths.	Satisfactory	Satisfactory	Satisfactory	Satisfactory	Satisfactory	Yes		Satisfactory	None for crew.
11 7 shower baths.	Good	Ample.	Ample.	Good	Ample			do	
12 Bath tub in each ward.	do	do	do	do	do	Yes		Sufficient	
13 4 bath tubs, 16 shower baths.	do	Satisfactory	Satisfactory	do	Satisfactory			Satisfactory	

	Laundry.	Storerooms.					Library.	Smoking and writing room.	Prison room.	Treasure chamber.
		Condition.	Capacity sufficient.	Properly ventilated.	Ample.	Good.				
18	None for troops, but sufficient for officers, passengers, and crew.				Ample.	Good.			Ample.	18
19	10 bath tubs, 22 shower baths.	Good.			Sufficient.	do.			Sufficient.	88
20	5 bath tubs, 16 shower baths.	Satisfactory.			Sufficient.	do.			Satisfactory.	60
21	8 bath tubs, 7 shower baths.	Good.			do.				Sufficient.	3
22	9 bath tubs, 17 shower baths.	Sufficient.	Good.		do.					
23	7 bath tubs, 29 shower baths.	Sufficient.	Good.		6 closets					
24	1 bath tub.	Sufficient.	Good.	Yes.	1 closet					
25	3 bath tubs.	Sufficient.	Good.		do.					
26	3 bath tubs, 1 shower bath.	Sufficient.	Good.		Ample.					8
27	2 bath tubs, 4 shower baths.	Sufficient.	Good.		2 closets					8
28	1 bath tub, 6 shower baths.	Sufficient.	Good.		5 closets					6
29	3 bath tubs, 32 shower baths.	Sufficient.	Good.		1 closet					24
30	2 bath tubs, 7 shower baths.	Sufficient.	Good.		4 closets					6
31	4 bath tubs, 32 shower baths.	Sufficient.	Good.		5 closets					32
32	3 bath tubs.	Sufficient.	Good.		1 closet					
33	1 bath tub, 18 shower baths.	Sufficient.	Good.		4 closets					18
34	No bathing facilities.				5 closets					
35	Tube and shower baths.									
36	3 bath tubs, 3 shower baths.									
37	11 shower baths.									
38										
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Crew satisfactory and sufficient.

Quartermaster.

Data from transport inspection reports—Continued.

No.	Laundry.	Storerooms.			Library.	Smoking and writing room.	Prison room.	Treasure chamber.
		Condition.	Capacity sufficient.	Properly ventilated.				
34								
36								
38	No laundry facilities.						Yes.	No.
41							No.	Yes.
42	No laundry facilities.						Yes.	Do.
50								
Transports (special).								
No.	Repairs satisfactory as to work and cost.	General condition of transport.	Stalls.		Drainage.	General remarks.		
			Capacity (animals).	Arrangement satisfactory.				
1	Not as to work.	Good order and condition.				Ship ready in every respect for voyage. The Burnside went to Hongkong for repairs and refitting, which were made at a cost of \$28,027.76 in gold. An excellent sea boat, and very steady.		
2		Recently repaired.						
3		(Good, except engines and boilers.				The Egbert is employed as a freight transport. General police and condition of the ship excellent. Inspector recommends that troops and passengers be not carried on this transport.		
5		Good, seaworthy condition.						
6	None	Good condition.				No complaints during the voyage arising from the condition of affairs. Inspector says: "I was impressed with the efficiency of the officers, the discipline of the crew, and the good condition, and cleanliness of all the different departments."		
7	Yes	Some repairs needed.						
8	None		300	Stalls not padded.		Inspector says: "I was most favorably impressed with the general condition of this ship. It was very neat and clean throughout."		
9	Yes							
10	Extra parts for repairs.					Inspector says: "The sanitary condition of the ship was excellent, and she was exceptionally clean."		
11	do	Hull and bottom good.						
12	do	do				Inspector says: "The ship made a good showing, and in general was clean."		
13	Yes	Good						
14	do	Hull good; bottom foul						

15	.....do	Satisfactory	.....	.....	.....	"Taken as a whole, hospital and ship, the Relief reflects great credit on the Departments which fitted her out and the officers who are serving on her."
16	Extra parts for repairs.	Seaworthy in all respects	.....	.....	.....	"Appears to be suitable for transportation of freight and animals, for which purpose she was purchased."
17	.....do	Hull and bottom good.	.....	.....	.....	"The vessel is well equipped and supplied, and is satisfactory and seaworthy in every respect."
18	Yes.	Hull good; bottom foul	140	.....	.....	"The Sumner is by no means an economical vessel, and her carrying capacity is small in comparison with her cost."
19	.....do	Satisfactory	.....	.....	.....	"The use of this vessel ought to be confined principally to freight, and no further expenditure in fitting her out as a troop ship made. This tug will save much expense in hire for towing, and at the same time will be of great service in the transportation of troops and supplies in and about the harbor."
20	Extra parts for repairs.	Hull and bottom good	.....	.....	.....	"Fitted up as a freight transport only."
21	Thoroughly well done.	.....do	.....	.....	.....	New repairs were being made at time of inspection.
22	Yes.	.....do	.....	.....	.....	"The record of this ship in carrying animals is excellent."
23	Extra parts for repairs.	Just overhauled at cost of \$19,841.	.....	.....	.....	"This ship is well adapted for a horse transport."
24	.....do	.....do	.....	.....	.....	"The ship, although slow, will be an excellent freight vessel."
25	.....do	Hull and bottom good.	690	.....	.....	"With the exception of a few repairs to horse stalls and whitewashing (nearly completed) she is in proper condition, with full equipment, and with ample supplies as regards coal; forage, water, and food for the animals; and attendants ordered to Manila on her."
26	Improperly done.	.....do	.....	.....	.....	"The general condition of the animals was good."
27	.....do	Excellent throughout	398	.....	.....	"She is not desirable as a troop ship, has not enough deck space for the number of troops carried, and is very poorly ventilated."
28	Extra parts for repairs.	Seaworthy	490	.....	.....	"The ship has been very successful in the transportation of animals."
29	.....do	Well equipped in every respect.	185	.....	.....
30	.....do	Hull and bottom first class.	.....	.....	.....
31	.....do	.....do	.....	.....	.....
32	A small one	Good; seaworthy	436	.....	.....
33	Extra parts for repairs.	Seaworthy	.....	.....	.....
34	.....do	Good	.....	.....	.....
35	Recently repaired, \$5,000.	.....do	262	.....	.....
36	.....do	.....do	.....	.....	.....

* Expense per capita for carrying men greater than on some other transports.

¹ Too slow for transport.

Data from transport inspection reports—Continued.

No.	Transports (special).			Stalk.		General remarks.
	Repairs satisfactory as to work and cost.	Repair shop for ship's machinery.	General condition of transports.	Capacity (animals).	Arrangement satisfactory.	
37		Yes	Good	456		"This vessel is only fairly well adapted for transport service."
38			Hull and bottom good			
39		Extra parts for repairs.	do	750	Badly arranged, but substantially made.	"This is a large, fine ship, with good beam, and if properly fitted out ought to be satisfactory for a horse transport."
40		do	do	921	Mostly very unsatisfactory.	
41		do	Hull and bottom good; seaworthy.			"The cargo space is small, and for the number of troops she can carry she is doubtless an expensive vessel."
43			Good	505		"The general condition of the ship was good."
44			do	465		Do.
45			Satisfactory			"The vessel is equipped to meet the requirements of a freight ship only."
46			Excellent	750	Well built, and padded. Ventilation not sufficient.	"The ventilating system should be improved."
47		Extra parts for repairs.	Good	550		"This vessel equipped for transportation of freight and animals only. Only fairly well adapted for the transport service." Carries freight only. The Inspector says: "The Flintshire is not suited for carrying troops."
48		do	do			
49			Seaworthy			
50						

APPENDIX D.

Statistical table of inspections made under Army Regulations, 968.

Designation and location.	Inspected.		Military personnel.					Civilian employees.		Monthly rent of build- ings.
	By whom.	When.	Officers.	Enlisted men.	Female nurses.	Civilian em- ployees.	Native labor.	Monthly pay.	Patients.	
<i>Quartermaster's depots.</i>										
Chickamauga Park, Ga.	Col. S. Snyder, A. I. G.	Oct. 18, 1900	1			20		\$960.00		
Jeffersonville, Ind.	do.	Oct. 11, 1900	2			1134		17,976.66		
New Orleans, La.	Maj. J. M. K. Davis, A. I. G.	Sept. 30, 1900				8		635.00		\$183.33
New York, N. Y.	Capt. E. D. Hoyle, A. I. G.	Feb. 8, 1901	1			2176		\$13,342.00		2,980.83
Omaha, Nebr.	Lieut. Col. W. H. Boyle, A. I. G.	Oct. 25, 1900	1			21		1,381.65		
Philadelphia, Pa.	Maj. H. K. Bailey, I. G.	June 3, 1901	4			3888		24,347.94		991.67
St. Asaph, Va.	do.	June 24, 1901	1			87		2,959.16		200.00
St. Louis, Mo.	Capt. J. B. Erwin, A. I. G.	Mar. 29, 1901	1			17		1,645.00		80.00
St. Louis, Mo., clothing depot	do.	do.	2			21		1,448.34		
San Francisco, Cal.	Lieut. Col. M. P. Maus, I. G.	Jan. 24, 1901	1			143		\$12,491.33		2,941.67
Washington, D. C.	Lieut. Col. C. H. Heyl, I. G.	June 18, 1901	1			101		7,212.62		325.00
Havana, Cuba.	Maj. B. K. Roberts, A. I. G.	May 15, 1901	2	1		80		5,991.64		
San Juan, P. R.	Col. P. D. Vroom, I. G.	May 25, 1901	1			80		4,706.66		
Honolulu, H. I.	Lieut. Col. M. P. Maus, I. G.	Apr. 16, 1901	1			105		6,546.66		346.67
Manila, P. I.	Maj. L. A. Lovering, A. I. G.	July 10, 1900	4	14		490	1413	\$35,882.17		2,050.00
Department Northern Luzon, Manila, P. I.	Capt. L. H. Strother, A. I. G.	June 20, 1901	1			21		1,940.01		487.50
<i>Subsistence depots.</i>										
Boston, Mass.	Col. P. D. Vroom, I. G.	Sept. 14, 1900	1			8		\$316.67		41.75
Chicago, Ill.	Col. S. Snyder, A. I. G.	Mar. 19, 1901	1			10		988.33		\$508.33
New Orleans, La.	Maj. J. M. K. Davis, A. I. G.	Sept. 30, 1900	1			2		200.00		
New York, N. Y.	Capt. E. D. Hoyle, A. I. G.	Feb. 6, 1901	2			33		2,634.99		416.66
Omaha, Nebr.	Lieut. Col. W. H. Boyle, A. I. G.	Oct. 25, 1900	1			5		425.00		
San Antonio, Tex.	Capt. F. W. Sibley, A. I. G.	June 13, 1901	1			62		190.00		

1 1,200 sewing women and 18 cutters not included.

2 Including employees office superintendent army transport service.

3 Including land transportation and water transport department.

4 Total rent of building. Subsistence depot occupies about two-thirds of building.

5 These employees also perform duty in office of chief commissary of department.

Statistical table of inspections made under Army Regulations, 968—Continued.

Designation and location.	Inspected.		Military personnel.				Civilian employees.			Monthly rent of build- ings.
	By whom.	When.	Officers.	Enlisted men.	Female nurses.	(Civilian em- ployees.	Native labor.	Monthly pay.	Patients.	
Subsistence depots—Continued.										
San Francisco, Cal	Lieut. Col. M. P. Maus, I. G.	Dec. 22, 1900	2			29		\$2,886.65		\$750.00
St. Louis, Mo	Capt. J. B. Erwin, A. I. G.	Mar. 29, 1901	1			7		620.00		75.00
Denver, Col.	Maj. A. C. Sharpe, I. G.	June 30, 1901	1			14		853.33		51.25
San Juan, P. R.	Col. P. D. Vroom, I. G.	May 27, 1901	1			18		636.66		
Honolulu, H. I.	Lieut. Col. M. P. Maus, I. G.	Apr. 15, 1901	1			(²)				150.00
Manila, P. I., receiving and shipping.	Lieut. Col. M. P. Maus, I. G.	May 23, 1901	4	6		41	21	3,751.64		1,350.00
Manila, P. I., sales.	Col. E. A. Garlington, I. G.	May 2, 1901	2	1		19	175	2,215.13		
Depot commissary, Department Southern Luzon, Manila, P. I.	Maj. R. A. Brown, A. I. G.	Dec. 15, 1900	1	7		9	175	2,893.83		(²)
Depot commissary, Department Northern Luzon, Manila, P. I.	Lieut. Col. P. W. West, I. G.	June 14, 1901	1	7		15	136	3,366.66		222.50
Hollo, P. I.	Capt. O. Bundy, A. I. G.	Oct. 9, 1900	1	4		3		316.66		400.00
Cavite, P. I.	Maj. L. A. Lovering, A. I. G.	June 12, 1901	1	1						
Medical supply depots.										
New York, N. Y.	Capt. E. D. Hoyle, A. I. G.	Feb. 11, 1901	1			26		1,782.30		1,000.00
San Francisco, Cal	Lieut. Col. M. P. Maus, I. G.	Sept. 8, 1900	1			20		1,433.33		(¹)
St. Louis, Mo	Capt. J. B. Erwin, A. I. G.	Mar. 29, 1901	1			13		1,066.66		161.66
Washington, D. C.	Maj. H. K. Bailey, I. G.	June 28, 1901	1	2		4		230.00		
Havana, Cuba.	Maj. E. K. Roberts, A. I. G.	May 29, 1901	1	5		4		(²)		
Manila, P. I.	Maj. L. A. Lovering, A. I. G.	Apr. 15, 1901	1	10		2	16	444.99		(¹)
Department Northern Luzon, P. I.	Lieut. Col. P. W. West, I. G.	Oct. 25, 1900	1	7			8	84.00		141.66
General hospitals.										
Hot Springs, Ark.	Capt. J. B. Erwin, A. I. G.	Mar. 27, 1901	3	26		14		560.00	96	
Fort Bayard, N. Mex.	Maj. A. C. Sharpe, A. I. G.	June 24, 1901	3	26	3	29		1,940.00	130	
Presidio of San Francisco, Cal	Lieut. Col. M. P. Maus, I. G.	June 30, 1901	12	179	46	18		(¹)	376	
Washington, D. C.	Maj. H. K. Bailey, I. G.	June 27, 1901	3	163					35	
Honolulu, H. I.	Lieut. Col. M. P. Maus, I. G.	Apr. 8, 1901	2	13					26	175.00
First Reserve, Manila, P. I.	Maj. L. A. Lovering, A. I. G.	May 9, 1901	9	115	28	9	27	716.00	268	
Second Reserve, Manila, P. I.	do	May 13, 1901	3	49	11		15	132.00	146	
Number 3, Manila, P. I.	do	May 16, 1901	5	62			8	30.00	194	
Santa Mesa, Manila, P. I.	do	May 17, 1901	6	106	18	16	13	898.00	269	
Emergency hospital, Manila, P. I.	do	May 21, 1901	2	7						

Convalescent at Corrigedor Island, P. I.	.....do	May 19, 1901	3	40	9	10	155.00	126	.....
Military hospital at Dagupan, P. I.	.....do	Jan. 17, 1901	4	74	16	21	157.50	151	.....
Military hospital at Iloilo, P. I.	Capt. O. Bundy, A. I. G.	Oct. 11, 1900	3	68	8	5	150.00	146	.....
United States military hospital at Negasaki, Japan.	Lieut.-Col. S. C. Mills, I. G.	Apr. 22, 1901	3	22	5	4	(5)	1	418.95
<i>Arsenals, ordnance depots, etc.</i>									
Augusta Arsenal, Ga.	Maj. J. M. K. Davis, A. I. G.	Sept. 24, 1900	1	29	16	.....	919.20	.....	.....
Benicia Arsenal, Cal.	Lieut. Col. M. P. Maus, I. G.	Jan. 25, 1901	2	64	17	.....	1,844.33	.....	.....
Columbia Arsenal, Tenn.	Col. S. Snyder, A. I. G.	Oct. 27, 1901	1	34	5	.....	218.00	.....	.....
Frankford Arsenal, Pa.	Maj. H. K. Bailey, I. G.	June 5, 1901	3	42	(*)	.....	.....	.....	.....
Fort Monroe Arsenal, Va.	Capt. E. D. Hoyle, A. I. G.	Apr. 8, 1901	1	12	6	.....	317.50	.....	.....
Indianapolis Arsenal, Ind.	Col. S. Snyder, A. I. G.	Oct. 8, 1900	1	23	4	.....	355.00	.....	.....
Kennebec Arsenal, Me.	Col. P. D. Vroom, I. G.	Sept. 6, 1900	1	15	1	.....	100.00	.....	.....
New York Arsenal, N. Y.	Capt. E. D. Hoyle, A. I. G.	June 26, 1901	1	.....	30	.....	2,072.49	.....	.....
Rock Island Arsenal, Ill.	Col. S. Snyder, A. I. G.	June 14, 1901	3	82	1,350	.....	(5)	.....	.....
San Antonio Arsenal, Tex.	Capt. F. W. Sibley, A. I. G.	Mar. 15, 1901	1	1	16	.....	1,067.07	.....	.....
Springfield Armory, Mass.	Col. P. D. Vroom, I. G.	Oct. 13, 1900	5	36	1,003	.....	58,904.68	.....	.....
Watertown Arsenal, Mass.	.....do	Sept. 22, 1900	3	43	324	.....	22,573.66	.....	.....
Watervliet Arsenal, N. Y.	.....do	Oct. 13, 1900	4	59	487	.....	34,188.39	.....	.....
Powder depot, Dover, N. J.	Maj. J. M. K. Davis, A. I. G.	June 15, 1901	1	(*)	31	.....	1,490.38	.....	.....
St. Louis powder depot, Mo.	Capt. J. B. Erwin, A. I. G.	Mar. 23, 1901	1	71	110	.....	7,874.99	.....	.....
Sandy Hook proving ground, N. J.	Maj. J. M. K. Davis, A. I. G.	June 14, 1901	1	.....	17	.....	(5)	.....	.....
Ordnance depot, Havana, Cuba.	Maj. B. K. Roberts, A. I. G.	May 29, 1901	1	1	8	.....	832.50	.....	.....
Ordnance depot, San Juan, P. R.	Col. P. D. Vroom, I. G.	May 24, 1901	1	1	20	.....	5,371.88	.....	.....
Ordnance depot, Manila, P. I.	Maj. L. A. Lovering, A. I. G.	June 3, 1901	1	36	.....	.....	.....	.....	.....
Total	.....	.....	154	1,553	146	5,682	296,943.64	1,967	19,304.43

* These employees also perform duty in office of chief commissary of department.

† Information not stated in report.

‡ Estimated monthly cost of tentage used for storage.

REPORT OF THE SECRETARY OF WAR.

APPENDIX E.

Statement showing property inspected and condemned, and inspected and retained in service, compiled from reports received during the fiscal years 1900 and 1901.

FISCAL YEAR 1900.

	Inspected and condemned.		Inspected and retained in service.			
	Number, cost stated.	Money value.	Number, cost not stated.	Number, cost stated.	Money value.	Number, cost not stated.
Staff	18,008,611	\$999,741.54	30,108,195	70,107	\$55,907.52	56,029
Posts	697,124	825,633.44	391,703	34,497	363,890.67	80,911
Arsenals and armories	2,202,601	792,294.94	61,577	5,462	1,815.56	42
Transports	219,557	10,767.58	7,115	5,635	562.59	133
Cavalry	641,965	252,664.90	113,336	20,485	86,104.33	1,263
Artillery	198,459	598,811.35	187,697	79,692	52,963.39	45,565
Infantry	1,107,483	222,197.87	22,797	75,940	74,471.76	13,852
Volunteer troops	124,745	32,159.99	38,397	64,918	23,709.93	161,508
Miscellaneous	6,356	2,420.25	1,638	739	523.43	37
Total	23,201,931	3,724,691.86	30,932,455	357,475	650,089.06	358,930

FISCAL YEAR 1901.

Staff	4,018,714	\$753,200.63	499,899	189,470	\$146,057.00	17,394
Posts	5,516,706	1,398,422.38	10,641,331	127,656	113,842.34	108,553
Arsenals and armories	177,143	20,232.65	491,378			
Transports	189,098	21,807.12	24,676	3,551	3,120.60	5,864
Cavalry	106,122	179,437.18	9,286	27,011	111,101.33	1,664
Artillery	39,365	21,233.97	10,289	5,482	28,454.11	941
Infantry	88,506	66,613.87	6,634	43,823	74,278.56	1,605
Volunteer troops	46,002	38,131.57	4,886	9,925	15,066.84	270
Miscellaneous	9,522	13,818.70	33,323	290	647.66	58,653
Total	10,193,180	2,512,900.07	11,721,652	408,458	487,562.44	192,934

APPENDIX F.

Data from inventory and inspection report, fiscal year 1901, showing condemnation of some articles of subsistence stores, inspected as designated.

Articles.	United States.		Philippines.		Cuba and Porto Rico.	
	Quantity.	Cost.	Quantity.	Cost.	Quantity.	Cost.
Bacon	16,156	\$1,800.84	238,737	\$26,510.53	10,833	\$948.76
Do. cans	84	12.23	1,036	172.71	1,190	222.11
Beans	251	9.65	33,414	1,045.45	9,245	314.32
Do. cans	123	9.49	4,945	465.94	3,255	211.49
Beef	13,011	969.13	52,523	4,131.76	1,896	265.47
Do. cans	467	133.48	135,223	2,029.09	131	30.98
Bread, hard and soft						
pounds	6,681	324.09	62,288	2,997.40	40,894	2,262.23
Butter	451	92.90	115,348	38,976.48	2,300	705.77
Cheese	484	49.57	5,584	906.01	4,304	708.64
Cigars	600	42.46	13,739	260.59	3,406	146.64
Cigarettes	16,910	64.91			37,812	312.18
Coffee	810	120.71	16,415	2,335.84	11,054	2,041.91
Corn meal	1,301	18.46	14,251	422.85	5,518	81.57
Crackers	213	19.46	4,347	518.60	9,449	1,702.74
Flour	47,135	872.88	819,899	13,804.86	148,825	3,235.68
Fruit:						
Dried						
do.	1,803	136.76	24,670	2,571.04	2,586	334.56
Canned	1,299	234.08	83,431	10,356.79	4,605	507.88
Ham	2,115	260.13	145,747	12,687.66	2,031	217.12
Do. cans			5,902	1,091.79	6	1.06
Hominy	246	3.98	17,070	605.03	4,444	160.22
Lard	291	19.34	711	60.86	571	36.84
Macaroni	19	1.24	21,469	2,075.53	7,083	324.24
Oatmeal	708	23.06	678,622	31,729.50	19,199	685.06

Data from inventory and inspection report, fiscal year 1901, showing condemnation of some articles of subsistence stores, inspected as designated—Continued.

Articles.	United States.		Philippines.		Cuba and Porto Rico.	
	Quantity.	Cost.	Quantity.	Cost.	Quantity.	Cost.
Onions.....pounds..	11,249	\$166.45	362,084	\$22,813.90	264	\$7.52
Potatoes.....do..	24,804	490.94	1,867,669	51,619.87	10,443	191.90
Pork.....do..	1,235	86.58				
Rice.....do..	225	5.24	92,506	2,311.39	17,179	795.08
Sugar.....do..	2,204	87.49	22,346	1,320.18	8,000	474.68
Tobacco:						
Plug.....do..	908	355.76	3,333	1,121.73	11,022	2,419.09
Smoking.....do..	7,974	5,083.09	9,180	5,046.26	2,845	1,501.20
Tomatoes.....cans..	1,516	134.79	119,400	12,872.11	7,843	544.38
Vinegar.....gallons..	5	.60	2,956	538.10	1,593	168.48
Yeast.....pounds..	390	42.90			519	69.78
Do.....cakes..	35	3.85	434	15.68	3,011	406.49
Total.....		11,631.49		252,915.62		22,016.02

Articles.	Alaska and Hawaii.		Transports.		Total fiscal year 1901.		Total fiscal year 1900.	
	Quantity.	Cost.	Quantity.	Cost.	Quantity.	Cost.	Quantity.	Cost.
Bacon.....pounds..	3,630	\$377.64	12,350	\$1,292.04	281,706	\$30,929.71	486,490	\$44,849.40
Do.....cans..			94	14.31	2,401	421.36		65.66
Beans.....pounds..			300	8.79	43,210	1,378.21	31,212	716.02
Do.....cans..	12	.96	2,053	99.21	10,398	787.09	3,223	220.48
Beef.....pounds..	797	214.41	140,776	8,660.67	209,008	14,241.44	229,022	13,188.98
Do.....cans..					35,821	2,193.55	442	75.56
Bread, hard and soft, pounds.					109,853	5,583.72	1,509,547	69,608.57
Butter.....pounds..	94	15.17	765	226.14	118,958	40,016.46	4,853	1,409.67
Cheese.....do..	283	42.49			10,653	1,706.71	20,937	3,702.62
Cigars.....number..			49,900	3,387.25	67,644	3,836.94	32,142	1,463.55
Cigarettes.....do..			110,680	732.60	165,402	1,109.69	22,650	314.86
Coffee.....pounds..					28,279	4,498.46	23,402	3,900.05
Corn meal.....do..	750	10.88	120	3.96	21,940	537.72	66,547	1,020.63
Crackers.....do..					14,009	2,240.80	15,171	1,969.02
Flour.....do..	165	3.19	107,356	2,012.99	1,123,215	19,929.60	757,696	14,606.12
Fruit:								
Dried.....do..			25	2.75	29,084	4,045.11	19,825	1,662.99
Canned.....cans..	24	3.34	483	119.26	89,842	11,221.35	19,145	2,541.51
Ham.....pounds..	276	33.74	324	37.26	150,493	13,235.91	13,683	1,193.99
Do.....cans..					5,908	1,092.85	2,359	470.57
Hominy.....pounds..	684	12.58	1,030	37.41	23,474	819.22	191,004	2,624.99
Lard.....do..					1,573	117.04	15,812	1,137.07
Macaroni.....do..	2	.26			28,573	2,401.27	5,158	483.53
Oatmeal.....do..	255	9.89	356	18.97	699,135	32,451.57	42,168	1,295.21
Onions.....do..	3,024	79.08	4,544	92.66	381,165	23,159.61	141,263	9,384.71
Potatoes.....do..	14,474	179.66	30,698	516.93	1,948,088	52,999.30	191,094	4,188.55
Pork.....do..			37,725	2,857.61	39,020	2,944.14	30,614	2,298.87
Rice.....do..			494	11.12	110,403	3,122.78	222,262	642.56
Sugar.....do..	40	1.96	531	24.40	33,121	1,908.71	36,987	1,505.74
Tobacco:								
Plug.....do..	1,415	530.63			16,678	4,427.21	119,827	50,275.52
Smoking.....do..	42	21.67	292	168.62	21,333	11,770.84	48,715	27,300.62
Tomatoes.....cans..	226	22.71	671	72.45	129,636	13,116.44	233,486	22,162.22
Vinegar.....gallons..					4,553	707.18	11,468	1,348.72
Yeast.....pounds..					909	112.68	32,451	1,430.62
Do.....cakes..					3,480	426.02	8,668	880.18
Total.....		1,560.16		20,397.40		308,520.69		290,020.21

¹ A good deal of this was designated as "Roast beef, pounds," and in such cases each pound is treated as a "can" in this table.

REPORT OF THE JUDGE-ADVOCATE
GENERAL, U. S. A.

WAR 1901—VOL 1—PT II—16

13
3

uisap- 4,806
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R E P O R T

OF THE

JUDGE-ADVOCATE-GENERAL, U. S. A.

WAR DEPARTMENT,
JUDGE-ADVOCATE-GENERAL'S OFFICE,
Washington, D. C., October 10, 1901.

Hon. ELIHU ROOT,
Secretary of War.

SIR: I have the honor to submit the annual report of the Judge-Advocate-General's Department for the year ending June 30, 1901.

The following data are compiled from the records received at this office of trials completed and published during the year covered by this report:

Commissioned officers tried by general court-martial:	
Regulars (convicted, 10; acquitted, 1; sentence or acquittal disapproved, 5)	16
Volunteers (convicted, 8; acquitted, 4; sentence or acquittal disapproved, 1)	13
Cadets tried by general court-martial (convicted)	3
Enlisted men tried by general court-martial:	
Regulars (convicted, 4,279; acquitted, 390; sentence or acquittal disapproved, 137)	4,806
Volunteers (convicted, 915; acquitted, 161; sentence or acquittal disapproved, 91)	1,167
Civilians tried by general court-martial:	
Those serving with the Army in the field (convicted, 30; acquitted, 4; disapproved, 3)	37
Discharged men held as general prisoners (convicted, 21; acquitted, 1; disapproved, 1)	23
Total trials by general court-martial	6,065
(Being over 600 less than in the preceding year.)	

The following table shows, approximately, the number of convictions in the Regular Army of different offences by general court-martial during the year:

Sixteenth Article of War:	
Wasting ammunition	10
Seventeenth Article of War:	
Losing accoutrements	36
Losing arms	28
Losing clothing	34
Losing Government property	3
Selling accoutrements	1
Selling arms	2
Selling clothing	53
Spoiling horse, arms, accoutrements, etc.	2

Twentieth Article of War:	
Disrespect to commanding officer.....	81
Twenty-first Article of War:	
Assaulting superior officer.....	13
Disobeying superior officer.....	238
Disrespectful or threatening language to superior officer.....	3
Twenty-second Article of War:	
Inciting mutiny.....	1
Joining in mutiny.....	1
Twenty-third Article of War:	
Failing to inform of intended mutiny.....	1
Twenty-fourth Article of War:	
Disobeying a commissioned officer quelling a fray.....	1
Disobeying a noncommissioned officer quelling a fray.....	11
Resisting commissioned officer quelling a fray.....	2
Thirty-first Article of War:	
Lying out of camp or quarters.....	9
Thirty-second Article of War:	
Absence without leave.....	941
Thirty-third Article of War:	
Failure to attend drill, roll call, etc.....	268
Thirty-fourth Article of War:	
Found one mile from camp without leave.....	6
Thirty-sixth Article of War:	
Hiring another to do his duty.....	1
Thirty-eighth Article of War:	
Drunkenness on duty.....	574
Thirty-ninth Article of War:	
Quitting post.....	119
Sleeping on post.....	263
Fortieth Article of War:	
Quitting company.....	3
Quitting guard.....	136
Forty-second Article of War:	
Misbehavior before the enemy.....	2
Quitting post to plunder and pillage.....	1
Forty-seventh Article of War:	
Desertion.....	544
Fifty-first Article of War:	
Advising another soldier to desert.....	5
Fifty-eighth Article of War:	
Arson.....	3
Assault and robbery.....	4
Assault with intent to kill.....	11
Assault and battery with intent to commit rape.....	1
Assault and battery with intent to rob.....	1
Burglary.....	8
Larceny.....	28
Manslaughter.....	10
Murder.....	6
Rape.....	5
Robbery.....	29
Sixtieth Article of War:	
Embezzlement.....	2
Larceny.....	61
Purchasing Government property.....	2
Selling Government property.....	3
Stealing Government property.....	3
Wrongful disposition of property.....	10
Sixty-first Article of War:	
Conduct unbecoming an officer and a gentleman.....	2
Sixty-second Article of War:	
Absence without leave, not chargeable under the thirty-second Article of War.....	126
Abandoning equipments.....	1
Abusing patient.....	1
Abusing noncommissioned officer.....	38

Sixty-second Article of War—Continued.

Abuse of authority	2
Abusing public animal	8
Aiding and abetting larceny	3
Aiding and abetting robbery	1
Aiding prisoner to escape	1
Allowing arms, etc., to be captured	2
Allowing prisoner to escape	54
Alteration of pass	1
Assault	62
Assault and battery	59
Assault upon noncommissioned officer	40
Assault upon noncommissioned officer in performance of duty	39
Assault upon sentry	9
Assault with dangerous or deadly weapon	23
Assault with intent to do bodily harm	28
Assault with intent to kill	27
Assault with intent to rape	5
Attempt at larceny	5
Attempt at robbery	3
Attempt to defraud a private party	3
Attempt to defraud the Government	3
Attempt to disarm sentinel	1
Attempt to escape from guardhouse or confinement	6
Breach of arrest	101
Breach of parole	1
Breach of pledge	1
Breach of trust	8
Breaking open locker	1
Bribery	4
Burglary	7
Buying liquor for prisoners	2
Careless handling of loaded firearms	13
Carrying concealed weapons	11
Committing a nuisance	34
Conduct causing arrest by civil authorities	4
Conspiracy	3
Creating an alarm in camp	9
Creating a disturbance	33
Creating disturbance in guardhouse	2
Damaging public property	1
Defrauding private parties	4
Destroying private property	4
Destroying public property	9
Disarming sentinel	1
Discharging firearms without cause	9
Disobedience of standing orders or regulations	132
Disobeying commissioned officer	100
Disobeying noncommissioned officer	339
Disobeying sentinel	10
Disorderly conduct	46
Disposing of clothing	17
Disrespect to noncommissioned officer	74
Disrespect to sentinel	5
Disrespect to superior officer	45
Drunk and disorderly	276
Drunkenness	159
Drunkenness, etc., causing arrest by civil authorities	11
Drunkenness, incapacitating for duty	29
Drunk on duty	58
Embezzlement	8
Encouraging assault	1
Endangering health of command	5
Escaping from guard or sentinel	18
Escaping from guardhouse	7
Escaping from hospital	3
Evasion of duty	6

Sixty-second Article of War—Continued.

Failure to pay debts	5
Failure to send correspondence through official channels.....	2
Failure to turn in extra ammunition.....	1
Failure to return borrowed property.....	1
Furnishing liquor to prisoners.....	7
False accusation.....	2
False statement or report	93
False swearing	2
Falsifying accounts.....	3
Fighting.....	19
Firing firearms, endangering life	17
Firing on civilians without cause	1
Forcing entrance into private dwelling.....	8
Forgery	14
Fraud	11
Fraudulent enlistment.....	161
Gambling	8
Harrassing, annoying, and looting natives and citizens.....	26
Having possession of intoxicating liquor	3
Incendiarism	1
Indecent exposure of person	9
Insubordinate conduct toward commissioned officer	40
Insubordinate conduct toward noncommissioned officer.....	94
Interfering with noncommissioned officer in discharge of his duty.....	3
Interfering with sentinel.....	7
Intimidation of witness.....	1
Introducing liquor into camp, quarters, etc.....	26
Larceny	268
Leaving post.....	11
Leaving post and abandoning rifle.....	3
Lying down on post	2
Making indecent proposals.....	14
Making and publishing libelous statement	1
Manslaughter	4
Malingering	11
Mutinous conduct.....	9
Neglect of duty	116
Obtaining money or property under false pretenses.....	11
Out of quarters after taps	21
Pawning borrowed property	2
Pawning Government property.....	3
Perjury.....	5
Permitting prisoner to obtain intoxicating liquor	22
Receiving and disposing of stolen property.....	6
Refusing to perform duty	11
Resisting arrest	62
Resisting arrest by civil authority	3
Resisting noncommissioned officer.....	8
Resisting sentinel.....	8
Robbery	31
Selling company property.....	5
Selling, losing, or wasting Government property.....	21
Sitting down on post	2
Sleeping while on duty.....	4
Sodomy	4
Striking civilian.....	7
Striking noncommissioned officer.....	7
Striking sentinel.....	1
Threatening civilian	25
Threatening noncommissioned officer.....	43
Threatening sentinel.....	7
Threatening soldier.....	19
Threatening superior officer.....	9
Unauthorized carrying of arms.....	1
Unnatural conduct	3
Using false pass	4

Sixty-second Article of War—Continued.

Using insubordinate language	10
Using insulting and abusive language	49
Using profane and indecent language	44
Using threatening and abusive language	44
Disorder, etc., charged as "conduct to the prejudice of good order and military discipline," not included under previous heads.....	166

The following table shows, approximately, the number of convictions in the Volunteer Army of different offences by general court-martial for the year:

Seventeenth Article of War:	
Losing accouterments	2
Losing arms	3
Selling arms	1
Selling clothing	6
Spoiling horse, arms, etc.	1
Twentieth Article of War:	
Disrespect to commanding officer.....	33
Twenty-first Article of War:	
Assaulting superior officer	11
Disobeying superior officer	83
Threatening language to superior officer	1
Twenty-second Article of War:	
Inciting mutiny	1
Twenty-fourth Article of War:	
Disobeying noncommissioned officer quelling a fray	6
Drawing weapon on noncommissioned officer quelling a fray	1
Resisting commissioned officer quelling a fray	1
Resisting noncommissioned officer quelling a fray	2
Striking noncommissioned officer quelling a fray	2
Thirty-first Article of War:	
Lying out of camp or quarters.....	6
Thirty-second Article of War:	
Absence without leave	42
Thirty-third Article of War:	
Failure to attend drill, roll call, etc.	38
Thirty-fourth Article of War:	
Found one mile from camp without leave	7
Thirty-eighth Article of War:	
Drunkenness on duty	182
Thirty-ninth Article of War:	
Quitting post	20
Sleeping on post	110
Fortieth Article of War:	
Quitting company	1
Quitting guard	32
Forty-second Article of War:	
Abandoning outpost	2
Abandoning stores	1
Cowardice	2
Misbehavior before the enemy	4
Throwing away ammunition in face of enemy	2
Forty-fifth Article of War:	
Relieving the enemy	1
Forty-seventh Article of War:	
Desertion	10
Fifty-first Article of War:	
Advising another soldier to desert.....	1
Fifty-eighth Article of War:	
Arson	4
Assault with intent to kill	5
Assault with intent to commit rape	3
Burglary	1
Larceny	18
Manslaughter	3

Fifty-eighth Article of War—Continued.

Murder	7
Rape	3
Robbery	13
Sixtieth Article of War:	
Embezzlement	1
Larceny	6
Selling Government property	2
Wrongful disposition of Government property	3
Sixty-first Article of War:	
Conduct unbecoming an officer and a gentleman	5
Sixty-second Article of War:	
Absence without leave, not chargeable under the thirty-second Article of War	10
Abuse of authority	1
Abusing commissioned officer	1
Abusing noncommissioned officer	9
Allowing prisoner to escape	17
Assault	29
Assault and battery	23
Assault upon noncommissioned officer	13
Assault upon noncommissioned officer in performance of duty	7
Assault upon sentry	5
Assault with dangerous or deadly weapon	3
Assault with intent to kill	4
Assault with intent to do bodily harm	7
Assault with intent to rape	2
Attempt to escape from guardhouse or confinement	2
Attempt at sodomy	1
Attempt to destroy public property	1
Breach of arrest	13
Breach of parole	1
Bribery	1
Burglary	1
Careless handling of loaded firearms	16
Committing a nuisance	5
Creating alarm in camp	1
Creating a disturbance	10
Cruelty to prisoners	2
Destroying private property	1
Destroying public property	3
Discharging firearms without cause	4
Disobedience of standing orders or regulations	29
Disobeying commissioned officer	28
Disobeying noncommissioned officer	111
Disobeying sentinel	6
Disorderly conduct	13
Disposing of accoutrements	1
Disposing of public property fraudulently	1
Disrespect to noncommissioned officer	20
Disrespect to sentinel	6
Disrespect to superior officer	24
Drunk and disorderly	121
Drunkenness	35
Drunkenness, incapacitating for duty	2
Drunk on duty	11
Embezzlement	1
Escaping from guardhouse or sentinel	5
Failure to pay debts	5
False statement or report	22
False swearing	1
Fighting	6
Forcing entrance into private dwelling	1
Forgery	3
Fraud	5
Fraudulent enlistment	4

Sixty-second Article of War—Continued.

Harassing, annoying, and looting natives and citizens.....	15
Indecent exposure of person.....	6
Insubordinate conduct toward commissioned officer.....	4
Insubordinate conduct toward noncommissioned officer.....	23
Introducing liquor into camp, quarters, etc.....	1
Larceny.....	52
Leaving ranks without permission.....	1
Making indecent proposals.....	1
Manslaughter.....	1
Mutinous conduct.....	4
Neglect of duty.....	29
Out of quarters after taps.....	2
Pawning borrowed property.....	2
Perjury.....	2
Permitting member of guard or prisoner to obtain intoxicating liquor....	10
Resisting arrest.....	16
Resisting noncommissioned officer.....	1
Resisting sentinel.....	4
Robbery.....	8
Selling company property.....	2
Sitting down on post.....	1
Threatening noncommissioned officer.....	18
Threatening sentinel.....	5
Threatening soldier.....	9
Threatening superior officer.....	9
Using profane and indecent language.....	9
Using threatening and abusive language.....	27
Wasting ammunition.....	1
Disorder, etc., charged as "conduct to the prejudice of good order and military discipline" (not included under previous heads).....	45

The number of men sentenced to dishonorable discharge in the Regular Army was 1,895, and in the Volunteer Army, 333; total, 2,228.

Death sentences were imposed by sentence of court-martial in 6 cases of enlisted men, 4 of these cases being on conviction of murder and 2 on conviction of desertion. The death sentences, except in one case of murder, were commuted by the President to dishonorable discharge, forfeiture of all pay and allowances, and imprisonment at hard labor for life in 3 cases, for seven years in 1 case, and for five years in 1 case.

The following table shows, approximately, the convictions of desertion (544 in the Regular Army and 10 in the Volunteer Army), classified according to the limits of punishment prescribed in the order of the President, published in General Orders, No. 42, Headquarters of the Army, 1901:

	No.	Limit of confinement.
Surrendered:		<i>Months.</i>
After an absence of not more than thirty days.....	20	12
After an absence of more than thirty days.....	82	18
Apprehended:		
In service not more than six months* at time of desertion.....	246	18
In service more than six months.....	206	30
Total number of desertions*.....	554	
Average limit of confinement.....		22.24+

In connection with this table it is to be observed that the limits of punishment are prescribed for "time of peace" only.

TRIALS BY MILITARY COMMISSION.

The records of military commissions received at this office during the year covered by this report show that 980 persons were tried, of which number 729 were convicted, 202 were acquitted, and the sentences in 49 cases were disapproved. The following table shows, approximately, the offenses:

Abduction	37
Accessories before the fact to assault with intent to kill	1
Accessories before the fact to murder	7
Aiding and abetting public enemy	14
Aiding murder	1
Arson	34
Assault and battery	21
Assault and battery with intent to do bodily injury	34
Assault and battery with intent to kill	53
Assault and battery with intent to rape	2
Assault with intent to rob	3
Assisting desertion	2
Attempt to force contributions for Katipunan Society	1
Attempt to intimidate civil officials	2
Attempt to rape	1
Attempt to rob	1
Being a spy	6
Being a war rebel	5
Being a war traitor	15
Burglary	23
Collecting contributions for the enemy	4
Consorting with outlaws	1
Conspiracy to defraud	8
Corresponding with the enemy	3
Disobedience of orders, etc., of officer over him	2
Disturbing the peace	15
Extortion under color of office	1
Forcible detention	1
Forcing contributions for "Guardia du Honor"	1
Giving information to enemy	3
Guerrilla warfare	16
Harboring an enemy	6
Inciting natives to treasonable acts	1
Instigating assault	2
Instituting insurgent government in town garrisoned by United States troops	1
Intimidation and assault	1
Kidnapping	104
Larceny	3
Lawlessness	1
Manslaughter	28
Misconduct in office	35
Murder	317
Obtaining money under false pretences	8
Publishing seditious articles	4
Rape	4
Receiving stolen property	2
Relieving the enemy	3
Resisting arrest	1
Robbery	106
Treacherous conduct	1
Unlawful possession of firearms	1
Unlawful purchase of public property	4
Violating elector's oath	1
Violation of the laws and usages of war	157
Violating oath of allegiance	12

Death sentences were imposed by military commissions in about 242 cases (nearly all natives of the Philippine Islands), on conviction of

the more serious crimes named in this list, and the sentences were executed in about 101 cases. In most of the remaining cases the sentences were commuted to imprisonment for terms varying from fifteen years to life imprisonment, while in a few cases the sentences were commuted to imprisonment for from five to ten years, and in a few cases the sentences were disapproved or set aside.

Upon the recommendation of the Department the Eighty-third Article of War, which defines the jurisdiction of the several inferior courts in respect to their power to punish, was amended by the Act of March 2, 1901 (31 Stats., 951), in such a way as to permit those tribunals to impose sentences of three months' forfeiture of pay or three months' confinement at hard labor, or both, at the discretion of the court. The operation of this enactment has been to simplify the administration of military justice and to make it unnecessary to refer a considerable number of cases to general courts-martial for trial, which, prior to the adoption of the amendment, were exclusively triable by such tribunals. In this respect it has fully justified the expectations which were entertained as to its necessity and propriety when the matter was presented to Congress.

In closing this report it gives me great pleasure to recognize the efficient assistance which I have received from the officers of the Department in their different fields of endeavor and from the employés, both permanent and temporary, who are attached to the Judge-Advocate-General's Office. Their labors have been zealous and untiring, and the services rendered by them have been entirely satisfactory.

Very respectfully,

GEO. B. DAVIS,
Judge-Advocate-General.

REPORT OF THE QUARTERMASTER-GENERAL.

REPORT

OF

THE QUARTERMASTER-GENERAL.

QUARTERMASTER-GENERAL'S OFFICE,
Washington, D. C., October 9, 1901.

SIR: I have the honor to submit the annual report of the operations of the Quartermaster's Department for the fiscal year ended June 30, 1901:

FINANCIAL STATEMENT.

By acts of Congress approved May 26 and June 6, 1900, there was appropriated for the regular service of the Quartermaster's Department for the fiscal year ending June 30, 1901, the sum of.....	\$54,316,917.00
During the fiscal year there was deposited to the credit of appropriations, 1900-1901, amounts received from sales to officers, etc.....	2,773,978.62
There was placed to the credit of appropriations by Treasury transfer warrants the sum of	12,600,000.00
Making a total of	69,690,895.62
Of this there was remitted to disbursing officers	\$50,268,314.94
There was paid out on account of settlements made at Treasury for claims and accounts	88,868.67
	<u>50,357,183.61</u>
Leaving a balance on July 1, 1901, available for payment of outstanding obligations incurred or fulfillment of contracts properly entered into within the fiscal year of.....	19,333,712.01
On July 1, 1900, there remained on hand from appropriation for military roads and bridges in Alaska the sum of.....	100,000.00
During the year there was remitted to officers.....	100,000.00
On July 1, 1900, there remained on hand from deficiency appropriation "January 1, 1899," the sum of.....	2,310,931.32
During the year there was placed to credit of this appropriation from proceeds of sales to officers, etc., the sum of.....	210,241.79
Making a total of	2,521,173.11
Of this there was remitted to disbursing officers	\$115,008.12
There was paid on settlements made at Treasury of claims and accounts	90,992.36
There was carried to surplus fund	2,315,172.63
	<u>2,521,173.11</u>

On July 1, 1900, there was on hand from regular appropriations for the service of the Quartermaster's Department pertaining to fiscal year ending June 30, 1900, the sum of	\$17,041,617.43
And from appropriations pertaining to previous fiscal years the sum of	16,038,671.81
And from appropriations for special and indefinite purposes, certified claims, etc	471,673.04

Making a total balance on hand of these appropriations of	33,551,962.28
For specific purposes there was appropriated during the fiscal year ending June 30, 1901.....	\$382,571.41
During the year there was deposited and transferred to credit of appropriations, other than those of 1901, as shown above, including the sum of \$626,851.21 for Pacific roads for years 1899, 1900, and 1901, and also the sum of \$1,657.06 for transportation of volunteers, war with Spain, and the sum of \$801.08 for reimbursement for bringing home remains of officers and others.....	5,512,887.44
	<u>5,895,458.85</u>

Making a total on hand from these appropriations of	39,447,421.13
Of said amounts there was remitted to disbursing officers the sum of.....	\$5,220,014.69
There was paid out on account of Treasury settlements and transfers.....	13,027,985.21
There was carried to surplus fund	8,499,776.96
	<u>26,747,776.86</u>
Leaving a balance on hand July 1, 1901, of.....	12,699,644.27

RECAPITULATION.

Remitted to officers and paid out on Treasury settlements from appropriations for the regular service of the Quartermaster's Department for the fiscal year ended June 30, 1901	50,357,183.61
From appropriation military roads and bridges, Alaska	100,000.00
From deficiency appropriation, January 1, 1899.....	206,000.48
From appropriations previous fiscal years and from indefinite and special appropriations	6,897,999.90
Total.....	<u>57,561,183.99</u>
Balance remaining in Treasury June 30, 1901, of appropriations for the regular service of the Quartermaster's Department for the fiscal year ended June 30, 1901.....	19,333,712.01
And of appropriations for previous fiscal years and for indefinite and special appropriations	12,699,644.27
Total.....	<u>32,033,356.28</u>

Of the \$200,000 appropriated by act of December 18, 1897, for "Relief of people in mining regions of Alaska," there has been charged against the same on the books of this office during the fiscal year 1901 the sum of \$2,597.18.

Of the \$50,000,000 appropriated by act of March 9, 1898, for "National defense," there has been charged against the same on the books of this office during the fiscal year the sum of \$277.21.

DUTIES OF THE QUARTERMASTER'S DEPARTMENT.

Under existing laws the Quartermaster's Department, under the direction of the Secretary of War, provides the Army with military

stores and supplies requisite for its use, such as clothing and equipage, tents, band instruments, tableware and mess furniture, equipments for post bakeries, fuel, forage, stationery, lumber, straw for bedding for men and animals, all materials for camp and for shelter for troops and stores, furniture for barracks, such as bunks, benches, chairs, tables, lockers, heating and cooking stoves for use in public barracks and quarters, tools for mechanics and laborers in the Quartermaster's Department, furniture, text-books, papers, and equipment for post schools, reading matter for post libraries, wagons, ambulances, carts, saddles, harness, water supply, sewerage, plumbing, illuminating supplies, and heating for all military posts and buildings.

The Department is also charged with the duty of providing transportation, by land and water, for troops, munitions of war, equipments, and all articles of military supplies from the place of purchase to the several armies, garrisons, posts, and recruiting places.

Under act of Congress amending section 1661, Revised Statutes, for arming and equipping the militia, this Department supplies quartermaster stores, clothing, and equipage to the militia of the several States and Territories, and transports the same to said States and Territories. It also furnishes transportation for ordnance and ordnance stores issued by the United States to the militia of the several States and Territories. It also transports the property for other Executive Departments on requisitions, payments therefor being made by the respective Departments to the carriers upon accounts forwarded through the Quartermaster-General's Office for that purpose.

This Department prepares the necessary plans and constructs all buildings at military posts, such as barracks, quarters, storehouses, hospitals, etc.; builds wharves; constructs and repairs roads for military purposes; builds all necessary military bridges; provides, by hire or purchase, grounds for military encampments and buildings; contracts for all horses for cavalry, artillery, and for the Indian scouts, and for such infantry and members of the hospital corps in the field campaigns as may be required to be mounted; pays for all incidental expenses of the military service which are not provided by other corps.

The care and maintenance of national cemeteries is an additional duty of this Department. It also provides suitable headstones to mark the graves of all soldiers, sailors, or marines who served during the late war, including those who have been buried in private cemeteries and other burial places.

Section 1139, Revised Statutes, makes it the duty of the Quartermaster-General, under the direction of the Secretary of War, to prescribe and enforce a system of accountability for all quartermaster supplies furnished the Army, its officers, seamen, and marines.

CLOTHING AND EQUIPAGE.

The sum of \$10,951,479.53 was available during the past fiscal year for use in providing clothing and equipage supplies for the Army and militia. Of this amount \$9,383,846.25 was remitted to officers of the Department and requisition for \$7,596.61 issued on settlements made by Treasury on account of claims, leaving a balance on hand June 30, 1901, of \$1,560,036.67.

The Department during the past fiscal year has promptly met all demands made upon it for the various articles of clothing and equipage

supplies, and special care has been taken to have such supplies conform to existing standards and specifications.

Attention is invited to the report of the officer on duty in this office who is charged with clothing matters for detailed information showing in consolidated form the various articles of clothing and equipage supplies that were purchased or manufactured, sold and shipped to the Army, including troops on duty in Cuba, Hawaii, Philippines, and Alaska; also the issues made to the governors of the States and Territories for use of the militia during the last fiscal year.

There were issued to the latter supplies amounting to \$320,896.90. There were also issued to the militia of the District of Columbia, under the act approved March 1, 1899, supplies amounting to \$2,981.33, which sum will not be reimbursed. There were also sold to the militia during the fiscal year, under the act approved February 24, 1897, clothing and equipage supplies to the amount of \$7,187.83.

Under the act of Congress approved May 26, 1900, making appropriation for the support of the Regular and Volunteer Army for the fiscal year 1900-1901, which provides for the replacement of such quartermaster supplies as were furnished by the States and brought into the service of the United States by volunteer troops during the recent war with Spain, claims for clothing and other quartermaster stores in kind to the value of \$293,417.33 have been allowed by this Department up to June 30, 1901, and supplies representing this amount have been turned over to the governors of the respective States and Territories interested, in settlement.

No issues of clothing and equipage were made to the Apache prisoners of war located at Fort Sill, Okla., it being the intention to make these Indians self-supporting.

KHAKI CLOTHING.

The khaki clothing manufactured for issue to the troops is now very satisfactory. The khaki material is the very best the Department can secure, and the color is almost wholly proof against the effects of sun, washing, and perspiration.

The khaki dyed cotton shirts sent to the Philippines have not proven a success, but experiments on this line are being continued. Experiments are also being made with khaki dye for woollen fabrics for shirts; 500 of these shirts, so soon as manufactured, will be sent to the Philippines for trial by the troops.

Reports have been received showing that the riding breeches, made of khaki material and issued to the troops in Cuba for trial, have given general satisfaction, and are superior to the mounted khaki trousers now supplied.

BLANKETS FOR TROPICAL SERVICE.

After satisfactory trial it has been determined to supply the army serving in the tropical countries with woollen blankets of a lighter weight. Specifications have, therefore, been prepared for a blanket to weigh 3 pounds, the warp of same to be composed of cotton and the woof of high one-half blood wool. Contract has already been made for these blankets, and 10,000 of them will be sent to the Philippines at an early date.

CHROME-TANNED SHOES.

In view of the great advancement that has taken place in the last few years in the tannage of calfskins, wherein great superiority is claimed for the black chrome-tanned wax calfskin upper leather over the oak-tanned leather heretofore used exclusively in the manufacture of army shoes, 25,000 pairs of the chrome-tanned shoes have been purchased for issue to the Army in order that they may be given a thorough and practical test.

Reports from the Philippines indicate that the russet shoes issued are satisfactory.

KHAKI-COLORED TENTS.

The tests given the khaki-colored tents by this office have proven satisfactory and it has consequently been determined to purchase only khaki-colored duck for the manufacture of tents hereafter.

TENTS FOR FLOOD AND FIRE SUFFERERS.

Under authority of the Secretary of War 878 tents were shipped from St. Louis depot and 323 from Fort Sam Houston, Tex., to the mayor of Galveston for the use of the sufferers from the tidal wave and storm which devastated the city of Galveston in September last.

There were also loaned to the mayor of Jacksonville 1,000 worn but serviceable hospital tents for the shelter of the people who, on account of the great conflagration there, were rendered homeless.

Fifty complete hospital tents were also sent to Elizabethton, Tenn., for the use of the flood sufferers there.

COLORS FOR NATIVE CHIEFS IN THE PHILIPPINES.

At the request of Brig. Gen. W. A. Kobbe, U. S. V., commanding Department of Mindanao and Jolo, P. I., six silken national colors with staffs were procured by this Department and shipped to the Philippine Islands for presentation to prominent native chiefs deserving recognition for their loyalty and friendship. General Kobbe, under date of June 17 last, in acknowledging the receipt of said flags, advises this office that the same were provided with silver plates suitably inscribed and presented with suitable formalities, and that they are held in great honor by the recipients, who take much pride in displaying them when occasion offers.

INSPECTION OF SUPPLIES.

Much attention has been given to perfecting the system of the inspection of the clothing and equipage supplies at the various purchasing and manufacturing depots of the Quartermaster's Department, and it is believed that the efforts in this direction will be beneficial.

CAVALRY AND ARTILLERY HORSES AND MEANS OF TRANSPORTATION.

The following statement shows the number and cost of public animals, wagons, and harness purchased by this Department from July 1, 1900, to June 30, 1901:

	Number.	Total cost.	Average cost each.
Cavalry horses.....	4,551	\$515,288.70	\$124.19
Artillery horses.....	115	44,826.12	141.96
Riding horses, for mounted infantry.....	3	66.99	72.21
Draft horses.....	252	2,315.00	147.85
Pack horses.....	20	236.00	78.00
Bell horses.....	5	135.00	45.75
Pack mules.....	3,515	1,390.00	64.00
Draft mules.....	134	194,178.42	114.98
Pack mules.....	6	65,371.35	82.27
Army wagons.....	73	245.00	174.00
Escort wagons.....	104	65,715.00	87.30
Farm wagons.....	6	1,717.50	65.06
Spring wagons, Dougherty.....	31	5,915.00	227.50
Wagons of other kinds.....	124	1,090.00	206.67
Ambulances, Red Cross.....	12	25,394.55	168.05
Trucks, 3 and 4 tons.....	12	2,543.00	264.30
Trucks, 1 ton.....	12	142.00	142.00
Dump carts.....	150	6,640.00	39.31
Dump carts, military.....	200	1,000.00	100.25
Water wagons.....	1	5,775.51	261.11
Spring wagons, delivery.....	124	2,941.00	126.16
Manufacturing wagons.....	150	391.00	126.87
Equip.....	4	251.00	78.25
Equip with harness.....	122	122,398.72	121.20
Apparel and parts.....	1,417	65,398.62	32.06
Total.....		1,475,728.45	

The total cost of army ranges, ovens, paulins, typewriters, and office safes amounted to \$280,928.79.

During the fiscal year there were shipped to the Philippine Islands and China for use of the army, 4,881 cavalry horses; 4,337 riding horses, for mounting infantry; 252 artillery horses, 20 draft horses, 134 riding horses, for pack trains; 5 bell mares, 3,515 draft mules, 765 pack mules, 689 escort wagons, 73 ambulances, 104 spring delivery wagons, covered; 31 Dougherty spring wagons, 124 farm wagons, 6 6-ton drays, 150 dump carts, 200 hand carts, 12 water wagons, 1 surrey, 3,724 sets wagon harness, 952 sets ambulance harness, 250 sets pony harness, 150 sets cart harness.

Approximately, 398,604 tons of coal were purchased during the year for transports.

During the fiscal year forage was purchased and shipped to the Philippines, China, Cuba, and Porto Rico as follows:

	Pounds.
Hay.....	100,274,189
Oats.....	83,627,038
Bran.....	1,021,331
Straw.....	3,347,396

SALE OF SURPLUS AND CONDEMNED ANIMALS.

During the past fiscal year there were condemned and sold 1,215 cavalry horses for \$51,288.70; average price, \$42.21 each; 115 artillery horses for \$4,826.12; average price, \$41.96 each; 3 riding horses for \$66.99; average price, \$22.33 each; 85 draft horses for \$3,908.76; average price, \$45.93 each. There were also sold 4 surplus horses for \$389.82; average price, \$97.46 each.

In addition to the foregoing, 414 mules were condemned and sold for \$19,018.53; average price, \$45.94 each. During the year there were 1,681 horses and 1,790 mules lost, died, stolen, etc.

There remained on hand at the close of the fiscal year, according to the latest reports, 22,690 horses, 10,794 mules, and 2 oxen.

TRANSPORTATION.

During the past fiscal year transportation was furnished by rail, water, wagon, and stage, exclusive of the army transport service, for 856,202 persons, 28,601 animals, and 308,506 tons of material.

There were transported over bond-aided railroads, 20,144 persons, 6,969 animals, and 112,550,342 pounds of freight. Six hundred and fifty-two accounts for telegraphic service, amounting to \$98,560.85, were examined in this office and transmitted for settlement during the year.

The cost of maintaining the 38 vessels owned by this Department, including the repairs thereto, amounted to \$193,339.94. These vessels are exclusive of the army transports owned and chartered by this Department in connection with the army transport service, and comprise those used in harbors and for communication with seacoast artillery posts in the United States.

ARMY TRANSPORT SERVICE.

At the beginning of the fiscal year there were in the army transport service 24 transports and 1 hospital ship owned by this Department. Of this number, 11 transports were in the Atlantic Fleet and 13 transports and 1 one hospital ship in the Pacific Fleet. These 25 vessels have an aggregate tonnage of 95,627 tons and a passenger capacity of 21,644.

During the past fiscal year 1 large steamship, the *Samoa*, renamed *Dix*, was purchased from Mr. Ansel L. White, for the sum of \$417,500. This vessel has a registered tonnage of over 6,839 tons, and a measured carrying capacity of over 11,000 tons. It is intended to fit her up as a combined animal and freight transport, with a carrying capacity of 661 animals and 7,227 tons measured cargo, the stalls for the animals to be arranged with a view of using the space they occupy for freight when so needed and they are not being utilized by animals.

REFITTING OF AND REPAIRS TO THE ARMY TRANSPORTS.

During the past fiscal year the transports *Buford* and *Kilpatrick* were refitted as troop ships, the former by the Newport News Shipbuilding and Dry Dock Company, Newport News, Va., at a contract price of \$397,637, and the latter by the John N. Robbins Company, of New York City, at a contract price of \$408,000. These transports are fitted for the accommodation of 68 officers and 984 men. Both transports have been transferred to the Pacific Fleet, sailing from New York for Manila via the Suez Canal route; the *Buford* leaving New York on November 7, 1900, with 25 officers and 953 enlisted men on board, and arriving at Manila December 29, 1900; the *Kilpatrick* sailing from New York November 13, 1900, with 68 officers and 984 enlisted men on board, arriving at Manila January 3, 1901.

The transport *Burnside* was selected for service as a cable ship, and

was fitted up for that purpose under a contract with the Morse Works Company, of New York, at a cost of \$173,758.50. The manufacture and installation of the cable tanks and other apparatus required for laying and repairing deep-sea cable were carried on under the supervision and at the expense of the Signal Department. This transport was completed and sailed from New York for Manila via the Suez Canal route on September 26, 1900, arriving at Manila on December 6, 1900, and has since been engaged in laying and repairing cable in Philippine waters.

The transport *Wright*, a small steamer which had previously been employed as a dispatch boat to the commanding general at San Juan, P. R., being required for interisland service in the Philippines, was thoroughly repaired, at a cost of \$66,483.88, the work being done by the Atlantic Basin Iron Works, of New York, and sailed from New York for Manila January 22, 1901, via the Suez Canal route, arriving at Manila on May 2, 1901. Owing to the small coal capacity of this ship, the voyage from New York was made via Bermuda, and while en route to that place she encountered a severe storm, which caused damage requiring slight repairs before resuming her voyage.

Another small transport, the *Ingalls*, which had been withdrawn from service in the West Indies, has been undergoing repairs preparatory to being sent to the Philippines for interisland service. The contract for repairs was entered into with the John N. Robbins Company, at a cost of \$79,500, the work to be completed by June 17, 1901. On June 14, 1901, while being dry docked by the contractors to receive her final coat of paint, the ship capsized and the work of righting her and repairing the damage sustained was not completed at the close of the fiscal year.

The transport *Sherman*, on her arrival at San Francisco, Cal., on January 7, 1901, was put out of commission and contract entered into with the Union Iron Works, of that place, for the repair and structural strengthening of the ship, at a cost of \$335,497.50. An additional sum of \$33,244 has been authorized to be expended for building a new lavatory and ice house and making other changes and repairs on the ship not included in the original contract. The strike among the mechanics in San Francisco has delayed the completion of the work on this ship and she was still in the hands of contractors at the close of the fiscal year.

ARMY TRANSPORT SERVICE ON THE ATLANTIC.

The reduction of the military forces serving in the islands of Cuba and Porto Rico having decreased the demand for transportation of troops and supplies between those islands and the United States, the transport service on the Atlantic was discontinued on June 30, 1901, and contracts entered into with commercial steamship companies having steamers plying between New York and prominent ports in the West Indies for the transportation of military passengers, animals, and supplies as the needs of the service required.

The transports which had been engaged in the service between New York and the West Indies were disposed of as follows:

The *Crook*, *Sedgwick*, and *McClellan*, after having certain repairs made to them, were put out of commission and laid up in New York Harbor, with sufficient care takers on board to insure their safety and keeping them available for any emergency that might require their further service.

The transport *Racelines*, also engaged in this service, met with an accident at her wharf in New York while being loaded with hay and other supplies for Cuba, on April 10, 1901. Fire broke out in her holds, to extinguish which the city fire department was called into service and the ship was flooded with water and sank. This vessel was raised by the Merritt & Chapman Derrick and Wrecking Company under a contract which provided that the total cost for the work was not to exceed \$20,000. The repairs to the ship by reason of this accident amounted to about \$8,000. As this transport was no longer required by the Department, her disposition by retransfer to the Navy Department or by sale was under consideration at the close of the year.

The transport *McPherson*, upon her voyage from New York to Cuba with a general passenger list and cargo of military supplies, in endeavoring to make the harbor of Matanzas, Cuba, on the morning of February 4, 1901, in a dense fog, ran aground on the north coast of Cuba, about 8 miles west of Matanzas. A steam lighter and two tugs were immediately dispatched from Havana to her relief, but a heavy wind came up at night rendering all means at hand unavailing, and it became necessary to contract with a wrecking firm having ample appliances to float the ship. The contract provided for delivery of the ship to the Department afloat in New York Harbor for the sum of \$70,000. The ship was successfully floated on June 2, 1901, and towed to Matanzas Harbor, whence she left for New York on June 30, 1901, in tow of tugs belonging to the contractors.

All the passengers on the ship at the time she grounded were safely landed and the cargo was discharged, but a portion of it was considerably damaged by water.

The following is a list of the steam lighters, tugs, and sloops which were in the army transport service at New York and at ports in Cuba at the beginning of the fiscal year, viz:

Name.	Class.	Where employed.
Ord	Tug	Manzanillo.
Reno	do	New York.
Reynolds	do	Havana.
Richardson	do	Matanzas.
Slocum	do	New York.
Gibbon	do	Havana.
Weitzel	do	Santiago.
Baker	Steam lighter	Havana.
Williams	do	Santiago.
Kearney	do	Cienfuegos.
Kanawha	Steam yacht	Havana.
Viking	do	Do.
Espananza	Sloop	Gibara.
Miguel	do	Do.

During the fiscal year the tugs *Reynolds* and *Weitzel* and steam yacht *Viking* were withdrawn from the service in Cuba and sent to New York, and the steam lighter *Kearney* to Fort Dade, Fla. The tug *Slocum*, after being put in thorough repair, was sent to San Francisco, Cal., via the Straits of Magellan, and is now engaged in handling the army transport ships and lightering passengers and supplies in San Francisco Harbor.

ARMY TRANSPORT SERVICE ON THE PACIFIC.

On July 1, 1900, the army transport service on the Pacific consisted of 13 transports and 1 hospital ship. During the year this fleet was

increased by the transfer from the Atlantic fleet of four transports and by the purchase of the steamship *Samoa*.

In addition to the above this Department had in service on the Pacific at the beginning of the fiscal year 11 chartered vessels (2 troop ships and 9 animal ships), and during the year increased this number by chartering 8 animal ships, 9 freight ships, and 2 troop ships, making a total of 49 vessels of all classes.

Nine vessels were also employed during the year at tonnage rates for the transportation of supplies to the Philippines and China.

The increase in the transport fleet on the Pacific and the employment of ships at tonnage rates was necessary in order to provide transportation for the troops, animals, and supplies to China; for the return of the Volunteer Army from the Philippines to the United States; for the Regular Army from the United States and China to the Philippines to replace the returning volunteers, and for the troops and supplies to Alaska.

During the fiscal year there were transported from the United States to the Philippines, China, and intermediate ports 29,832 persons, consisting of officers, enlisted men, and others. During the same period there were returned to the United States from the Philippines and intermediate ports 32,518 persons, which includes the officers and enlisted men of the following regiments of volunteer infantry: Twenty-sixth, Twenty-seventh, Twenty-eighth, Twenty-ninth, Thirtieth, Thirty-first, Thirty-second, Thirty-third, Thirty-fourth, Thirty-fifth, Thirty-sixth, Thirty-seventh, Thirty-eighth, Thirty-ninth, Fortieth, Forty-first, Forty-second, Forty-third, Forty-fourth, Forty-fifth, Forty-sixth, Forty-seventh, Forty-eighth, and Fort-ninth; also the officers and men of the Eleventh Volunteer Cavalry.

In the matter of transportation of animals from the United States to China and the Philippines it may be said that the experience gained by the Department during the past three years has enabled it to so perfect its system of fitting up vessels for this purpose and the proper care of the animals en route as to reduce the number of fatalities to a minimum. Several shipments have been made from the Pacific coast to Manila without having the animals unloaded in transit to rest, and upon arrival at destination it was only necessary to allow the animals to rest a day or two before putting them to work.

But for the fact that the chartered vessel *Leelanaw* encountered a severe storm while en route from San Francisco to Manila with a cargo of animals, resulting in the loss of all excepting one mule, no serious accident would have to be reported. As examination of the stalls and fittings of the ship after the storm had abated showed same to be intact, the loss of the animals in the above instance was in no sense due to any failure to exercise proper care, and is wholly on account of the severity of the storm.

The semimonthly sailings of transports from San Francisco and Manila established during the previous fiscal year have been satisfactorily maintained and the entire service performed without the loss of a single human life.

The total movement on the Pacific, as reported, has been 110,716 passengers, 17,943 animals, 248,028 tons of freight, 2,200,508 pieces of baggage and miscellaneous packages, 1,151,560 pounds of mail matter, and \$8,339,750 in money.

The following is a list of the army transports owned by this Department and in service at the close of the fiscal year, showing their tonnage, carrying capacity, and where employed:

Name.	Tonnage.	Passenger capacity.		Cargo capacity with troops.	Where employed.
		Officers.	Men.		
				<i>Tons.</i>	
Buford	3,039	68	984	2,764	Pacific fleet.
Burnside	2,194	31	178	1,006	Do.
Crook	4,126	91	870	2,867	Atlantic fleet.
Dix	6,839	12	.....	9,939	Pacific fleet.
Egbert	2,845	20	.....	3,237	Do.
Grant	5,590	82	1,827	1,887	Do.
Hancock	5,164	67	1,062	2,160	Do.
Ingalls	1,347	31	182	588	Being fitted for Pacific.
Kilpatrick	5,046	68	984	2,764	Pacific fleet.
Lawton	3,497	61	663	1,288	Do.
Logan	5,672	146	1,650	1,766	Do.
McClellan	3,006	75	180	2,156	Atlantic fleet.
McPherson	3,699	113	626	1,533	Do.
Meade	5,641	88	1,176	1,376	Pacific fleet.
Rawlings	2,898	59	492	425	Atlantic fleet.
Relief	3,094	18	288	978	Hospital ship, Pacific fleet.
Rosecrans	2,608	20	606	2,086	Pacific fleet.
Sedgwick	4,770	118	890	906	Atlantic fleet.
Seward	2,100	28	108	740	Pacific fleet.
Sheridan	5,673	126	1,842	1,744	Do.
Sherman	5,780	112	1,776	1,810	Do.
Sumner	3,458	63	768	811	Do.
Terry	1,338	100	240	.....	Out of commission in New York.
Wright	871	17	100	154	Pacific fleet.
Thomas	5,796	133	1,648	1,984	Do.
Warren	4,375	53	1,239	1,000	Do.

ARMY TRANSPORT SERVICE IN THE PHILIPPINES.

For the service of the Department in the Philippines there were purchased during the fiscal year 1 steamship, the *Kong See*, renamed *Liscum*; 2 lighters, 8 launches, 2 lorchas, and 66 rowboats and lifeboats, at an expenditure of \$115,182.20. There were also hired and chartered 32 steamers and 14 small vessels, at a total cost of \$746,596.35.

Three large troop ships (the *Pennsylvania*, *Indiana*, and *Garonne*, chartered on the Pacific coast) and the army transports *Lawton*, *Sumner*, and *Wright* have also been employed during portions of the year in the transportation of troops and supplies to China and to inter-island ports in the Philippines.

There were in service in the Philippines during the fiscal year, including the transport *Wright*, the following number of vessels owned by the Department, viz:

Steamships	5
Stern-wheel steamboats	2
River gunboats	5
Steam lighters	9
Steam tugs	38
Lighters	14
Launches	18
Coal hulks	3

The hospital ship *Relief* has also been employed in the Philippines during the year, transporting sick and disabled soldiers from China and the various ports in the islands to Manila.

ARMY TRANSPORT SERVICE IN ALASKA.

The work of transporting troops and supplies to the Department of Alaska was in progress at the beginning of the fiscal year. For this service the transports *Rosecrans*, *Lawton*, *Egbert*, and *Seward* and the chartered transport *Athenian* were employed during the summer of 1900.

The transport *Lawton*, after returning from her first trip in June, 1900, made two voyages—one in July and the other in September—to Alaska, bringing to the United States on each trip a load of destitute American citizens.

The chartered steamship *Kvarven* made two trips to Alaska in July and September, 1900, with coal, lumber, and other supplies, but upon arrival at St. Michael on her last trip, owing to the lateness of the season and a severe storm then prevailing, she was unable to discharge all of her cargo and had to return to Seattle with the greater portion of it on board.

Prior to the close of the fiscal year the transports *Rosecrans*, *Warren*, and *Egbert* were sent from San Francisco to Puget Sound for service in transporting troops and supplies to Alaska during the present season. The steamship *Hyades* was also chartered for the same service. Some supplies were also sent by commercial line steamers at tonnage rates.

The *Warren* left Seattle, Wash., for St. Michael, Alaska, June 6, 1901, with troops, civilian employees, and a cargo of supplies. The *Hyades* left the same port for St. Michael on June 19, 1901, with a cargo of stores. On June 30, 1901, the transports *Rosecrans* and *Egbert* were undergoing repairs at the Bremerton Navy-Yard, preparatory to engaging in the Alaskan service.

The transport *Seward*, used as a dispatch boat by the department commander, which had been returned to Seattle, Wash., before close of navigation in the fall of 1900, left for St. Michael, Alaska, on June 10, 1901, with 13 passengers, 415 tons of supplies, and 75,209 feet of lumber.

The total volume of business between the United States and Alaska during the fiscal year amounted to 17,235 tons of freight, 25 animals, and 992 passengers.

TRANSPORTATION SERVICE BETWEEN UNITED STATES AND CUBA, PORTO RICO, PHILIPPINE ISLANDS AND INTERMEDIATE PORTS, CHINA, AND ALASKA.

There were transported during the fiscal year the following:

	Passen- gers.	Animals.	Freight.	Packages.
From United States to Cuba	8,533	496	22,183	3,206
From Cuba to United States	8,715	239	3,334	2,810
From United States to Porto Rico	1,151	5	4,027	894
From Porto Rico to United States	2,484	312	1,188	835
From United States to the Philippines, China, and inter- mediate ports	29,832	14,033	224,908	1,456,969
From Philippines and intermediate ports to United States	32,518	.....	3,385	15,383
From United States to Alaska	165	25	17,235	.....
From Alaska to United States	827	.....	.....	.....
From Philippines to China and return	7,250	1,262	2,500	.....
To and from ports in Philippine Islands from Apr. 1, 1901, to June 30, 1901	40,124	2,623	.....	728,156
Total	126,599	18,995	278,760	2,208,253

EXPENDITURES, ARMY TRANSPORT SERVICE.

The expenditures on account of the army transport service during the year are reported as follows:

For purchase of vessels	\$659,070.64
For fitting and repairing owned vessels	3,190,087.84
For charter of vessels	3,744,440.30
For fitting up chartered vessels and restoring them on termination of charter	768,638.27
For tonnage hire of vessels	459,420.62
Total	8,821,657.67

BARRACKS AND QUARTERS.

The sum of \$3,000,000, under the act approved May 26, 1900, was provided for barracks and quarters. Of this amount there was expended during the fiscal year the sum of \$2,641,530.09 for construction and repair of buildings, for rent, etc.

MILITARY POSTS.

Under the act approved June 6, 1900, the sum of \$1,000,000 was appropriated for the construction of buildings at, and the enlargement of, such military posts as in the judgment of the Secretary of War may be necessary, for the artillery in connection with the adopted project for seacoast defense, and for the purchase of suitable building sites for said barracks and quarters.

From this appropriation the law provided that the following amounts should be expended for the purpose indicated, viz:

For repairs to barracks and quarters at Fort Leavenworth, Kans.	\$30,000
Toward construction of water and sewer system and for roads and walks and grading at Fort Lincoln, N. Dak.	40,000
For construction of additional stables at Fort Riley, Kans.	30,000
For buildings and other necessary improvements at Fort Meade, S. Dak.	50,000
For continuing work of rebuilding quarters and for rebuilding regimental guardhouse at Fort D. A. Russell, Wyo.	50,000
For acquiring by purchase or condemnation the land in the square surrounding Fort Constitution, N. H.	30,000

The work specially authorized at the posts mentioned is in course of construction.

No expenditure was made during the fiscal year for the \$30,000 authorized for purchase of land at Fort Constitution.

Deducting the above-mentioned sums from the total appropriated leaves a balance available for other posts and purchase of lands of \$770,000. This sum was apportioned as follows:

Fort Adams, R. I.	\$150.00
Fort Baker, Cal.	118,435.00
Fort Banks, Mass.	2,493.00
Fort Columbia, Wash.	29,191.00
Fort Dade, Fla.	2,785.00
Fort DuPont, Del.	3,850.00
Great Diamond Island, Maine.	149,850.00
Fort H. G. Wright, N. Y.	47,389.00
Fort Howard, Md.	1,187.00
Fort Miley, Cal.	30,030.00
Fort Morgan, Ala.	4,070.00
Fort Mott, N. J.	15,910.00

Fort Pickens, Fla	\$2,425.00
Fort Point, Cal	28,006.00
Fort Revere, Mass	25,265.00
Fort Rodman, Mass	8,279.00
Fort Stevens, Oreg	21,565.00
Fort Strong, Mass	107,474.00
Sullivan's Island, South Carolina	60,082.00
Fort Terry, N. Y	65,050.00
Fort Washington, Md	12,767.00
Fort Wetherill, R. I	9,648.00
Printing and advertising	1,723.03
Balance available for extra work on buildings and for purchase of land ..	22,376.97
Total	770,000.00

Under act approved May 26, 1900, the sum of \$191,347.53 was apportioned to the various military posts in the United States for construction and repairs of hospitals already established and occupied; also the sum of \$55,000 for improving and repairing the Army and Navy General Hospital at Hot Springs, Ark.

The sum of \$386,846.02 was expended during the fiscal year from appropriation "Army transportation" for structural water supply, sewerage, drainage, etc.; \$205,914.36 for roads, walks, grading, bridges, etc.; \$65,710.10 for wharves, and \$44,909.32 for miscellaneous work.

The sum of \$257,097.12 was also expended from appropriations "Regular supplies" for heating, lighting, cooking apparatus, construction of bakehouses, etc.

CONSTRUCTION OF POSTS FOR COAST ARTILLERY.

Including all buildings completed up to July 24, 1901, there are accommodations for 358 officers and 9,806 enlisted men at coast artillery posts. Of these, quarters for 12 officers and barracks for 1,468 men are in temporary buildings, and also barracks for 308 men which are not suitable for continued occupancy.

There were under construction at the close of the fiscal year quarters for 61 officers and barracks for 1,400 men. Adding these and deducting the temporary and unsuitable buildings above mentioned, there will be permanent and suitable accommodations for approximately 407 officers and 9,430 enlisted men of the coast artillery on completion of the buildings which were in course of construction on June 30, 1901.

For the detailed information concerning the construction at the various seacoast posts attention is invited to the report submitted herewith of the officer on duty in this office who has charge of this branch of the work.

FORT MACKENZIE (SHERIDAN), WYO.

By special act approved April 7, 1900, Congress appropriated \$100,000 for continuing the work of constructing the necessary buildings, barracks, quarters, and stables at this post.

The following buildings have been contracted for at this post and are in course of construction, viz: 1 barrack for 100 men, 2 double sets officers' quarters, guardhouse, hospital, hospital steward's quarters, quartermaster and subsistence storehouse, double set noncommissioned officers' quarters, coal shed.

PHILADELPHIA DEPOT—SCHUYLKILL ARSENAL.

Congress, under the act approved June 6, 1900, appropriated \$16,000 for roofing over and putting floors in the courtyard of the present No. 3 fireproof building, to provide storage and shipping space, and also \$6,000 for rearrangement of the inspecting and issuing department. This work was commenced in September of last year and was practically completed at the close of the fiscal year.

GENERAL HOSPITALS.

Improvements costing \$42,583.05 were contracted for at the Fort Bayard General Hospital.

The chapel and reading room at the Presidio General Hospital, San Francisco, has been completed, at a cost of \$3,405, and contract made for construction, plumbing, and wiring one commanding officer's and one double set of officers' quarters, costing \$27,945.41.

On June 10, 1901, a fire occurred at the Presidio, which destroyed some of the hospital buildings, the estimated loss being \$50,000.

ROAD AT THE PRESIDIO, CALIFORNIA.

Congress, by special act approved June 6, 1900, appropriated \$5,000 for continuing the work on road to national cemetery. This was expended on construction of 843½ feet of wall. The length of wall remaining to be constructed is reported as 11,850 feet.

RESERVATIONS.

Under the act approved July 8, 1886, all the lots comprising Old Fort Brady, Mich., with the exception of that known as the "Cemetery Lot" and a certain square held as a site for a public building, have now been disposed of at full appraised valuation, \$70,522.54, which sum, less expense attending sales, has been deposited to the credit of the United States Treasurer.

The "Cemetery Lot" was, on August 25, 1897, leased for a term of five years, for a nominal consideration, to Company G, Fifth Regiment Michigan National Guard, for the erection of an armory for drill purposes.

No action has been taken looking to the sale of the Old Fort Omaha reservation, which covers about 80 acres, and none will be taken until further advised, as under instructions of the Secretary of War of September 17, 1900, the buildings and grounds of this reservation are to be kept in order for future military use if necessary.

SEACOAST LANDS.

During the past fiscal year steps have been taken to secure additional lands at Fort Mott, N. J., and Fort Armistead, Md.

Under act approved June 6, 1900, efforts are being made to secure the necessary land in the square surrounding Fort Constitution, N. H., for use of barracks and quarters for troops.

Under authority of the above-mentioned act, 111 acres of land have been secured at Great Diamond Island, Maine, at a cost of \$149,850, and 647 acres at Fort Terry, N. Y., at a cost of \$64,700.

DES MOINES, IOWA.

Under act approved April 4, 1900, providing for a new army post at Des Moines, Iowa, 400 acres of land have been donated to the United States and accepted by the Secretary of War, favorable opinion regarding title having been rendered by the Attorney-General.

ELECTRIC LIGHTING.

Electric wiring has been installed in buildings at the new seacoast posts with a view of lighting these posts from the fortification plants.

REFRIGERATING PLANT AT MANILA, P. I.

The large refrigerating plant at Manila is reported practically complete, and ice and cold storage are now being furnished the Subsistence Department.

All requisitions from Manila for materials for water and sewer systems have been promptly filled, including distilling plants and sterilizers, which are reported to have been of incalculable value in diminishing the sick rate among the troops.

SEATTLE, WASH.

The work of the quartermaster's department at this place was under the direction of Maj. W. W. Robinson, jr., until September 28, 1900, when he was relieved by Maj. George Ruhlen, quartermaster, who continued in charge during the remainder of the fiscal year in repairing and fitting up transports in connection with supplying the troops in Alaska, Honolulu, the Philippines, and China.

MILITARY DEPARTMENTS IN THE UNITED STATES.

From reports received from the chief quartermasters of the eight military departments in the United States, it is shown that a large amount of work has been accomplished by those charged with the quartermaster's duties during the past fiscal year, and that the troops serving in these military departments have been promptly and well supplied by the Quartermaster's Department.

ALASKA.

During the fiscal year there has been authorized for labor and material to construct shelter for troops and supplies at different posts in this department the sum of \$264,446.65.

At Fort Liscum, barracks, four sets of officers' quarters, hospitals, noncommissioned staff officers' quarters, stables, storehouses, etc., have been completed.

The building of a military road from Valdez to the Yukon River, for which an appropriation of \$100,000 was made by Congress on May 26, 1900, has been commenced, but to what extent the work has progressed has not been reported to this office.

GENERAL DEPOTS, QUARTERMASTER'S DEPARTMENT.

There are six general supply depots connected with this Department, viz: New York, Philadelphia, St. Louis, Jeffersonville, Washington,

and San Francisco. The transactions at these depots are both extensive and important, and the officers in charge of this work have had large experience and have performed their respective duties during the past year in a most efficient and satisfactory manner.

DEPOT AT CHICKAMAUGA PARK, GEORGIA.

The quartermaster's establishment at this place was so materially reduced by the shipment of stores to other points where they were needed that the officer on duty there was relieved in March, 1901, and the depot placed under the control of the depot quartermaster at Jeffersonville, Ind. Shipment of the stores and supplies continues, and the discontinuance of this depot is anticipated at an early date.

DEPOT AT ST. ASAPH, VIRGINIA.

This depot has been transferred to the depot quartermaster at Washington, and Capt. E. H. Parsona, assistant quartermaster, U. S. V., under whose zealous and energetic management it has heretofore been, was honorably discharged the volunteer service at the close of the fiscal year.

The expense of its maintenance has been considerably reduced, and further reductions will probably be made.

DEPARTMENT OF CUBA.

Capt. Chauncey B. Baker is the chief quartermaster, Department of Cuba, and in charge of the quartermaster's department at Havana. He is charged with the general supervision of all the affairs relating to the quartermaster's department throughout Cuba. In addition to these duties he also has charge for insular department of the care and supervision of public buildings in Havana and vicinity, and the work of construction and repairs in connection therewith. Also the duties relating to the electric-light plants, La Fuerza and municipal hospital No. 1; ice plant, municipal hospital No. 1; Tricornia Military Railway, machine shops at arsenal, the distribution of school furniture and supplies throughout the Department of Cuba, the receipt and disbursement of insular funds for various purposes, and with the receipt and responsibility for a large quantity of insular property.

Captain Baker reports that the troops upon the island have been promptly supplied with all stores necessary for their comfort and efficiency, and that the supply of clothing has been highly satisfactory.

He further reports that the animals now on the island are thoroughly acclimated, and there is but little sickness due to peculiarities of the climate. The experience of the last three years has been of value to the Department in the treatment of this class of diseases. The fatal disease, glanders, is prevalent throughout the island, and great care is constantly required to prevent its extension to Government stock. In spite of the utmost care, however, cases now and then appear among the animals of the Government. In such cases the suspected animal is promptly isolated, and a general test is made of all animals that have been exposed to the disease. As a result, no general outbreak has ever occurred among the Government stock.

The most common disease affecting stock in Cuba is recurrent ophthalmia, the exact nature and cause of which are not well understood.

It is generally believed, however, by veterinarians throughout the island that the climatic conditions prevalent, the alternating effect of the sun's rays and the drenching rains, have much to do with the disease, which results ultimately in total blindness.

Stock on first arriving in Cuba undergoes a period of acclimatization, during which animals are attacked by a form of influenza, which often develops into pneumonia. These climatic troubles are more persistent and more fatal if animals are transferred to this island in the spring of the year. The best season for importing animals is the late autumn—November and December.

The wheel transportation throughout the island is reported in good condition, though the condition of the roads and the climate makes it difficult to keep vehicles in good repair.

During the fiscal year there were 654 condemned horses and 136 condemned mules sold at auction throughout the Department.

All classes of condemned stock bring prices on the island. The average price of horses for the year was \$51.72. The average for mules was \$68.73. Many of these animals were wholly unserviceable.

TRISCORNIA MILITARY RAILWAY.

The Triscornia Military Railway was originally built with a view of receiving troops from transports and conveying them to camp sites without involving their transit through the city of Havana, and to provide for the transmission of supplies and subsistence for these troops without transporting such materials through districts supposed to be infected with yellow fever. The road was built upon the recommendation of a board of officers which assembled in Havana late in 1898, of which Col. J. G. C. Lee, U. S. A., was president.

During the year the only freight moved over the road has been forage, wood, and materials for construction purposes. On account of the reduced volume of freight now being transmitted, it is recommended that the operation of the road by the quartermaster's department be abandoned, and that freight hitherto shipped via Triscornia be sent direct to the arsenal for transfer to ultimate destination by means of wagon transportation or local railway service. It is not believed that the reduced amount of traffic over the railway warrants the further continuance of its operation by the quartermaster's department.

NAVY-YARD.

At the beginning of the fiscal year the old Spanish navy-yard was loaned to the quartermaster's department for its use. This affords excellent facilities to the quartermaster's department for receiving and shipping stores, inasmuch as ample wharfage and warehouse facilities are thus provided without cost. The depth of water (15 feet) is not sufficient to admit ocean-going vessels, but as all freight is handled in this harbor by means of lighters the accommodations are ample.

The navy-yard is inclosed by a high stone wall, and the warehouses are all well secured from the chances of theft or accident from fire.

The department commander authorized this department to rehabilitate the old Spanish marine railway and shops adjacent thereto, and during the last year they have been repaired and put in good condition at insular expense. They have afforded excellent facilities for

the execution of repairs to Government vessels located in and about the harbor of Havana.

MILITARY POSTS.

The lands in Cuba occupied for military purposes consist of, first, military reservations, formerly the property of the Spanish Government, and, second, lands and buildings leased for military purposes. All rentals, whether for lands or buildings, in use for military purposes on the island of Cuba, are paid out of the insular treasury.

BARRACKS AND QUARTERS.

A few of the old Spanish barracks are now being used by the United States for troops as barracks. Many have been converted into school-houses or made use of for other civil purposes.

The buildings occupied by the troops in this department are usually of frame, covered with either tile, sheet-iron, or tarred-paper roof. These were built by the quartermaster's department from funds of the insular treasury, or from quartermaster's funds which were afterwards reimbursed to the department, and, as a rule, are a satisfactory cover for troops.

All troops on the island are now provided with quarters, with the exception of the troops at Camp R. S. Mackenzie, near Puerto Principe, garrisoned by the Eighth Cavalry. Troops at this station have been continuously under canvas from the first occupation of the island, now nearly three years ago. The quarters for officers at the various posts are modest but comfortable. At Holguin, Puerto Principe, and Manzanillo the stables are covered with thatched roof. These stables are peculiarly suited to this climate. They are exceptionally cool, owing to the great thickness of the roof. This circumstance has invited attention to the feasibility of utilizing this class of roof in temporary structures on account of its cheapness.

The posts at Puerto Principe, Columbia Barracks, and the abandoned posts of Santa Clara, Placetas, Pinar del Rio, Guanajay, and Ciego de Avila, were all obliged to use their tentage for temporary camps during the last year, in order to afford isolation from yellow fever at these stations.

PORTO RICO.

The troops serving in Porto Rico have been properly supplied during the fiscal year by this Department.

At the beginning of the fiscal year the Department of Porto Rico consisted of headquarters, 9 posts, 1 subpost. On December 15, 1900, when the department was abolished and made a district and consolidated with the Department of the East, the district was composed of headquarters, 4 posts, and 1 subpost. This reduction enabled the Department to make a large saving in the expenses of the Quartermaster's Department in Porto Rico in the way of supplies, civilian employees, etc.

HONOLULU.

Maj. George Ruhlen, quartermaster, U. S. A., having been transferred for service elsewhere, was relieved from his duties at this station by Maj. W. W. Robinson, jr., quartermaster, on February 11,

1901, who has been in charge as depot quartermaster and superintendent of transport service since that date.

Considerable reduction has been made in rentals and services of employees during the year, and still further reductions will be effected.

In November, 1900, 90 tons of coal, valued at \$681.30, were consumed by fire, caused by spontaneous combustion, and on June 1, 1901, two hay sheds and their contents were also destroyed, the estimated value of which was \$7,000.

The sewerage system of the city of Honolulu has been completed, which will doubtless improve the sanitary conditions of the place, and the supply of water obtained from the city water plant is ample.

The forage used by the United States has been of good quality.

During the year 45 transports en route to and from Manila called at this port, and all were furnished with supplies of coal and water, and many of them had repairs made to machinery and equipment. The average detention was sixty-four and one-half hours.

Two wharves constructed by the Navy Department have been available for the army transport service and answer the requirements at this station.

The cost of supplying transports with water being excessive, arrangements were made with the Navy Department for sinking an artesian well on the naval reservation.

The work was completed April 3, 1901, at a cost of \$6,294.40, and the well can supply 1,235,968 gallons of water per day, which rises from 33 to 34 feet above sea level, is of an excellent quality, and contains only 5.217 grains of chlorine to the gallon. It is used on the vessels of the Army and Navy.

PHILIPPINE ISLANDS.

The past fiscal year has been one of great activity for this Department in the Philippines, due to the increased number of posts, the continual movement of troops made necessary by the military operations, the returning of 25,000 volunteers to the United States, and in receiving and replacing the regulars from the United States in the posts occupied by the volunteers.

The depot at Manila was much affected by the increase in the posts and troops to be supplied, and the volume of business increased to such an extent that it became necessary to separate the land transportation office, placing it under an officer to be located at the corral. Later, the army-transport service was also separated. The wisdom of these changes was shown in the improved condition of these branches of the service since their separation. The fact that the disbursements at this depot amounted to \$5,337,219.73 during the past fiscal year will give some idea of the extent of the business transacted.

The question of handling the business arriving at Manila Harbor is one of great difficulty, but has been successfully met by the officer in charge, and the expense incident thereto has been considerably reduced by the discharge of many cascoes and lorchas, made possible by a thorough system in their use. The check system has also been perfected so that the losses have been reduced to a minimum. Expenditures for repairs to steam launches have been reduced by the employment of more competent engineers. To meet the necessities at Manila and seacoast posts launches and sailboats were purchased at reasonable

prices at Hongkong. The use of coal hulks in coaling the transports at Manila has resulted in a great saving of time and expense.

The duties devolving upon the land transportation office are handling all receipts, issues, and sales of animals, wagons, fuel, and forage, and running the shops for repairing wagons and for shoeing horses and mules. The corral is well suited for its purposes. The efficiency of this branch of the service has been kept up during the year, and considerable saving has been made by caring for sick animals, so as to make them fit for duty, and in repairing wagons and harness. Native forage has been largely used, so as to save the expense of bringing same from the States.

The experience gained in returning volunteers to the States from the Philippines led to the establishment of a camp at Manila to accommodate two full regiments. The officers' tents were floored and the men were furnished with cots. Arrangements were made to provide everything required for camp use, so that each regiment upon arrival turned over to the Quartermaster's Department all of its property, and the regimental officers were relieved of accountability therefor, and the regiment ready to embark whenever directed to do so.

The officers charged with the affairs of this Department in the Division of the Philippines have satisfactorily performed the duties devolving upon them and the troops serving in that division have been promptly and fully supplied.

CHINA.

With exception of the legation guard at Peking, all the American troops have been withdrawn from China, and all surplus stores and supplies which had previously been sent from the United States and Manila have been returned to the latter place or San Francisco.

The construction of barracks and quarters for the legation guard has been authorized, at a cost of \$60,000.

No report showing the operations of the Quartermaster's Department in China during the year has been received at this office.

DEPOT AT NAGASAKI, JAPAN.

Owing to the war in China, the quartermaster's business at this depot was largely increased during the first six months of the fiscal year. Among other articles purchased were tugs, lighters, handcarts, etc., as well as a six months' supply of wood for use of the troops in China; two steamers were also chartered. The total disbursements during the year amounted to \$748,086.10.

The vessels of the transport service calling at Nagasaki were promptly supplied with coal and water and every effort made to avoid their detention at that port from any cause.

The officer on duty at this depot obtained much useful information in regard to the conditions prevailing at Taku, which was furnished to the commanding officer of the Ninth United States Infantry, en route to China.

NATIONAL CEMETERIES.

During the past fiscal year there were 2,121 interments in the eighty-three national cemeteries, making a grand total of 344 363 interments in these cemeteries to June 30, 1901.

Five thousand three hundred and twenty-eight headstones were provided during the fiscal year to mark the graves of known Union soldiers, sailors, and marines in national, post, city, and village cemeteries.

ROADWAYS.

The sum of \$13,156.32 was expended during the fiscal year for repairs to roadways to national cemeteries which have been constructed by special authority of Congress.

The work on the roadway leading from the city of Newbern, N. C., to the national cemetery near that city, authorized by act approved May 14, 1900, and the road from Cache River Bridge, Pulaski County, Ill., to the graveled roadway extending from Mound City, Ill., to the national cemetery near that city, as authorized by act approved June 4, 1900, is in progress.

The necessary repairs and improvements have been made during the past fiscal year at all the national cemeteries, and the grounds, including drives and walks, kept in good order.

OPERATIONS OF THE BURIAL CORPS.

A burial corps was organized at Washington, D. C., and sent to the Philippines, under the superintendence of Mr. D. H. Rhodes, the employee of this Department who rendered such satisfactory and efficient service in this capacity during the previous fiscal year in disinterment and returning to the United States our honored dead.

Mr. Rhodes, with a corps of fifteen assistants, sailed from San Francisco, Cal., October 1, 1900; called at Honolulu, H. I., and disinterred and prepared for shipment to the United States 38 remains; sailed from thence to the island of Guam, where 7 were exhumed; from thence the corps proceeded to Manila, P. I., arriving at that place the latter part of October, 1900.

At Manila the corps provided itself with the necessary maps and sketches showing the location of cemeteries, burial plots, and graves from which disinterment were to be made, and entered upon its duties. There were 1,375 remains disinterred and prepared for shipment to the United States at different points in the islands composing the Philippine group.

Two small burial corps will be permanently established in the Philippines, which it is thought will result in securing the return of remains to the United States with the least possible delay after burial, when death occurs at places where it is impracticable to embalm the remains for immediate shipment.

Mr. Rhodes also sent a small party to China from the Philippines, where, under the supervision of Mr. Selon F. Massey, 138 remains were disinterred and sent home, together with 11 which were buried at Nagasaki, Japan. A supply of caskets and other materials were sent to China, which will enable the Department to make shipment of remains from there without sending a special party for the purpose.

The burial corps which operated in Cuba was organized at Havana by Mr. C. F. Norton, and during the year 170 bodies were disinterred and sent to New York City, 130 of which were shipped to their former homes at Government expense, and 40 were buried and the remainder to Arlington National Cemetery for interment therein.

No remains were brought from Porto Rico during the past fiscal year, as the civil law of the island prohibits the exhumation of dead bodies until three years after burial, and until the expiration of this limit the Department can take no steps toward bringing to the United States the 28 remains which are buried in that island.

Under an arrangement with the Navy Department, the Quartermaster's Department disinters and ships to destination the remains of persons serving in the Navy or United States Marine Corps and receives reimbursement therefor from the Navy Department. During the past fiscal year a total of 66 remains were thus removed and brought to the United States, 25 of which were for the Navy and 41 for the Marine Corps.

From the following statement, which has been compiled from reports received in this office, it will be seen that 1,825 bodies of officers, enlisted men, and others were returned to the United States during the fiscal year, viz:

From Cuba	170
From Philippine Islands	1,317
From Honolulu	38
From China	138
From Nagasaki, Japan	11
From Island of Guam	7
Died en voyage on army transports	144
Total	1,825

Of the above, 823 were returned to relatives and friends, 713 were interred in the Presidio of San Francisco National Cemetery, 117 in the Arlington National Cemetery, and 172 remained at San Francisco, Cal., on June 30, 1901, to be disposed of.

Messrs. Rhodes, Massey, and Norton, with their assistants, have satisfactorily performed the important work intrusted to them of preparing and returning to their native land the remains of those who died in the Philippines, China, island of Guam, Honolulu, and Cuba.

PERSONNEL.

Prior to February 2 1901, the number of officers provided by law for the Quartermaster's Department consisted of 58 officers of the regular establishment and 70 volunteer officers, making a total of 128 officers in all.

Under section 16, act of Congress approved February 2, 1901, to increase the efficiency of the permanent military establishment of the United States, the following officers were provided for this Department:

Regular establishment:	
Quartermaster-General, with rank of brigadier-general	1
Assistant quartermasters-general, with rank of colonel	6
Deputy quartermasters-general, with rank of lieutenant-colonel	9
Quartermasters, with rank of major	20
Quartermasters, with rank of captain	60
Military storekeeper, with rank of captain	1
Total	97
Volunteer establishment, to be continued in service during emergency, for duty in Philippine Islands and on transports:	
Assistant quartermasters, with rank of captain	24
Total, regular and volunteers	121

The military storekeeper having retired from active service on January 12, 1901, the position was thereby discontinued by operation of law.

It having been determined not to continue in service any of the twenty-four volunteer quartermasters authorized under emergency for the Philippine and transport service, all the officers of the Quartermaster's Department holding volunteer commissions were discharged from the volunteer service on June 30, 1901, in accordance with the provisions of the act approved March 2, 1899, leaving only the ninety-six officers of the regular establishment for the performance of all the duties pertaining to the Quartermaster's Department.

The increase in the number of officers in the grades of colonel, lieutenant-colonel, major, and captain, provided for in the new organization under act of February 2, 1901, created thirty-nine original vacancies. These vacancies permitted the promotion of a number of worthy officers of this Department who had rendered long and valuable service, and also made it possible to recognize the services of the volunteers by appointment in the regular service as captain and quartermaster of a number of the volunteer quartermasters and other volunteer officers who had rendered efficient and meritorious service in the Volunteer Army since April 21, 1898.

Since the date of my last annual report the Department has suffered the loss of one of its promising young volunteer officers, Capt. Raymond Sulzer, assistant quartermaster, U. S. V., who died in San Francisco Harbor February 3, 1901, just as the transport from the Philippines reached the harbor bringing him to his native land. This officer, though young in years and service, had shown himself to be a capable and efficient officer.

On March 2, 1901, Capt. Edgar S. Dudley, assistant quartermaster, U. S. A., was appointed major and judge-advocate in the Regular Army, thereby severing his connection with the Quartermaster's Department.

OFFICERS DETAILED FOR DUTY IN THE QUARTERMASTER'S DEPARTMENT.

Under authority contained in section 36, act of Congress approved February 2, 1901, three officers, at the close of the fiscal year, had been detailed from the line of the Army for duty in the Quartermaster's Department for a period of four years, to fill vacancies in this Department.

POST QUARTERMASTER-SERGEANTS.

Under act approved February 2, 1901, Congress authorized 150 post quartermaster-sergeants, an increase of 45 over the number previously authorized. This increase has enabled the Department to appoint a number of these sergeants and assign them to duty in the Philippines and at other points where their services were urgently required. At the close of the fiscal year there were 138 of these sergeants in service. The remaining vacancies will be filled from the most efficient applicants who are from time to time designated for examination for the position.

DETACHMENT OF ARMY SERVICE MEN, QUARTERMASTER'S DEPARTMENT,
WEST POINT, N. Y.

This detachment is composed of 141 enlisted men. They are reported as having performed satisfactory service during the past fiscal year.

CIVILIAN EMPLOYEES, QUARTERMASTER'S DEPARTMENT, AT LARGE.

The subject of employees was given careful attention during the past fiscal year, and wherever possible the force has been reduced to the lowest limit consistent with the public interests.

Based upon a report of a board of officers sent to Porto Rico to investigate the question of civilian employees at that place, a large reduction in said employees has been effected, and steps taken to classify under civil-service rules from July 1, 1901, such of the war-emergency employees on duty there as entered the service prior to and on May 29, 1899, and whose continued services were found necessary. This action, when consummated, will make the civilian employees of this Department serving in Porto Rico subject to civil-service rules, the same as all other classified employees.

By reason of the discontinuance, on June 30, 1901, of the army transports running between New York, Cuba, and Porto Rico, large reductions of war-emergency employees on duty on said transports and in connection with the transport service in New York City have been made and steps taken to close up the transport service at that place. Further reductions will be made from time to time in the force of employees hired in connection with that work until the business relating thereto is entirely completed.

CIVILIAN EMPLOYEES, QUARTERMASTER-GENERAL'S OFFICE.

There are at present provided, for duty in the office of the Quartermaster-General, 218 clerks and others. Of this number 120 belong to the permanent force and 98 to the temporary force.

These employees have performed efficient and commendable service during the past fiscal year, and are needed in dispatching the large volume of work which continues to come to this office.

It is believed that it will be in the interests of the service to absorb into the regular force of this office a portion of the most efficient temporary employees; otherwise the best of these employees will naturally seek permanent places elsewhere, and as soon as secured, relinquish their temporary appointments, which will result in injury to this office and to the public service. It is therefore recommended that Congress be requested to provide at its next session for the permanent appointment of about 50 per cent of the most efficient of these temporary employees. The remaining 50 per cent can be retained in their temporary character for another year, or until it can be definitely determined how long their services may be required.

To the chief clerk of this office and the principal clerks of the several branches credit is due for their efforts in successfully keeping the increased volume of work from falling in arrears.

CONCLUSION.

In the accomplishment of the large amount of work that has devolved upon this Department in supplying the Army in the United States,

the Philippines, and other distant stations, and also in returning the volunteer regiments, the officers of this corps, as well as the clerical force and other employees of the Department at large, are entitled to the highest praise for prompt and efficient service rendered by them.

The following-named officers have also performed most able and valuable service during the year as assistants in the transaction of the business of this office: Lieutenant-Colonels Bird and Patten, Majors Martin and Hodgson, and Captains Carson, Schreiner, and Dare.

Respectfully submitted.

A. S. KIMBALL,
Assistant Quartermaster-General, U. S. A.,
Acting Quartermaster-General.

THE SECRETARY OF WAR.

LIST OF PAPERS ACCOMPANYING ANNUAL REPORT OF THE QUARTERMASTER-GENERAL, FISCAL YEAR ENDING JUNE 30, 1901.

1. Annual report of Lieut. Col. Charles Bird, deputy quartermaster-general, U. S. A., for fiscal year ending June 30, 1901.
2. Annual report of Lieut. Col. William S. Patten, deputy quartermaster-general, U. S. A., for fiscal year ending June 30, 1901.
3. Annual report of Maj. M. C. Martin, quartermaster, U. S. A., for fiscal year ending June 30, 1901.
4. Annual report of Maj. F. G. Hodgson, quartermaster, U. S. A., for fiscal year ending June 30, 1901.
5. Annual report of Capt. F. M. Schreiner, quartermaster, U. S. A., for fiscal year ending June 30, 1901.
6. Annual report of Capt. J. Z. Dare, quartermaster, U. S. A., for fiscal year ending June 30, 1901.

APPENDIX.

WAR DEPARTMENT, QUARTERMASTER-GENERAL'S OFFICE, *Washington, September 13, 1901.*

GENERAL: I have the honor to submit herewith the following report of the operations of the transportation division of this office during the fiscal year ended June 30, 1901.

The following statement shows that during the fiscal year ended June 30, 1901, transportation was furnished, exclusive of transport service, for 856,202 persons, 28,601 animals, and 308,506 tons of material:

	Railroad.	Water.	Wagon.	Stage.	Government vessels. ¹	Total.
Passengers:						
Officers	2,875	367	.....	44	56,921	60,207
Men	78,519	4,724	.....	811	716,941	796,996
Total	76,394	5,091	.....	855	773,862	856,202
Animals:						
Horses	13,582	4,626	.....	.....	744	18,952
Mules	6,286	2,584	.....	.....	779	9,649
Total	19,868	7,210	.....	.....	1,523	28,601
Stores:						
Subsistence	38,697	14,535	4,864	.....	2,680	60,726
Quartermaster's	59,307	32,335	20,521	.....	5,529	117,692
Ordnance	27,329	4,110	1,264	.....	2,743	35,446
Medical	1,854	2,881	720	.....	385	5,840
Signal	1,529	2,465	21	.....	465	4,480
Miscellaneous	19,073	3,342	55,112	.....	6,795	84,322
Total	147,789	59,668	82,502	.....	18,547	308,506

¹ This includes all passengers carried on Government ferryboats plying between military posts and adjacent cities.

ACCOUNTS AND CLAIMS FOR TRANSPORTATION.

The records show that 5,705 accounts and claims for transportation, amounting to \$438,556.68, have been received at this office, examined, and transmitted for settlement during the fiscal year ended June 30, 1901.

Of these, 2,066 accounts amounting to \$320,515.52 were chargeable to appropriations of the War Department for the several fiscal years in which the service was rendered; 3,639 accounts of other Departments, amounting to \$11,804.16, exclusive of bond-aided service and telegraph accounts.

Bond-aided Pacific Railroad companies.

	Passen- gers.	Animals.	Freight.
Southern Pacific Co. and Central Pacific R. R. Co	19,627	6,963	<i>Pounds.</i> 111,456,810
Sioux City and Pacific R. R. Co.	517	3	1,091,702
Missouri Pacific R. R. Co. (Central Branch Union Pacific)			1,530
Total	20,144	6,969	112,550,342

There were 2,343 accounts for bond-aided service received at this office, amounting to \$1,640,662.81. Of these, 1,482 accounts were chargeable to appropriations of the War Department, amounting to \$1,531,400.42, and 861 accounts for other Departments, amounting to \$109,262.39, as shown by the following table:

	Number of accounts.	Amounts.	Subsidized.	Unsub- sidized.	Remarks.
Southern Pacific Co.	1,213	\$1,529,829.81	\$1,138,251.91	\$391,577.90	War Department.
Do.	845	109,256.38	90,204.73	18,990.65	Other Departments.
Sioux City and Pacific R. R. Co.	269	1,570.61	1,237.40	333.21	War Department.
Do.	16	7.01	4.58	2.43	Other Departments.
Total	2,343	1,640,662.81	1,239,758.62	400,904.19	

TELEGRAPH ACCOUNTS.

The accounts for telegraphic service examined by this office and transmitted for settlement were 652, amounting to \$98,560.85.

Principal movements of troops during the year.

Troops.	Movements.	Cost.
First Artillery	One battery changing station, Department of the East	\$621.15
Do.	do	1,387.60
Do.	do	1,224.00
Do.	do	1,290.00
Do.	do	2,261.88
Second Artillery	do	542.90
Seventh Artillery	One battery from Department of the Missouri to Department of California.	13,816.25
Do.	One battery changing station, Department of California....	462.45
Do.	One battery from Department of California to Department of the Missouri.	11,480.60
Do.	One battery from Department of the East to Department of California.	12,458.12
Do.	do	11,228.62
Twelfth Artillery	One battery changing station, Department of Texas	346.03
Coast Artillery	One battery changing station, Department of the East	949.34
First Cavalry	One troop from Department of Dakota to Department of the Colorado.	3,127.83
Do.	Three troops from Department of Dakota to Department of the Columbia.	14,165.37
Do.	One troop from Department of the Missouri to Department of the Columbia.	6,137.20
Do.	Two troops from Department of the Missouri to Department of the Columbia.	11,077.38
Third Cavalry	Four troops from Department of the East to Department of California.	16,584.50
Fifth Cavalry	Four troops from Department of the Missouri to Department of the Colorado.	20,241.68
Do.	Two troops changing station, Department of the Missouri...	8,733.53
Do.	Four troops from Department of the Colorado to Department of California.	14,075.82
Do.	Two troops changing station, Department of the Colorado ..	6,938.04

Principal movements of troops during the year—Continued.

Troops.	Movements.	Cost.
Fifth Cavalry	Four troops from Department of the East to Department of California.	\$32,032.65
Do.....	Four troops changing station, Department of the East	2,145.76
Do.....	Two troops changing station, Department of the East	2,315.70
Do.....	Two troops from Department of the East to Department of the Columbia.	15,326.29
Sixth Cavalry	Two troops changing station, Department of California	151.41
Do.....	do.....	456.14
Do.....	One troop changing station, Department of the Columbia	299.40
Do.....	Three troops changing station, Department of the Columbia	4,813.09
Do.....	Two troops from Department of the Columbia to Department of California.	1,119.33
Ninth Cavalry	Two troops from Department of the Colorado to Department of California.	11,473.11
Tenth Cavalry	One troop changing station, Department of Texas.....	872.23
Do.....	Three troops from Department of Texas to Department of California.	11,622.00
Do.....	One troop from Department of Texas to Department of California.	4,149.86
Do.....	One troop from Department of the Colorado to Department of the Columbia.	3,140.93
Eleventh Cavalry	Four troops changing station, Department of the East.....	4,040.39
Do.....	Two troops changing station, Department of the East	2,102.76
Twelfth Cavalry	Six troops changing station, Department of Texas.....	3,358.03
Thirteenth Cavalry	Two troops changing station, Department of Dakota.....	7,378.62
Fourteenth Cavalry	Four troops changing station, Department of the Missouri	1,304.98
Do.....	Four troops from Department of the Missouri to Department of the Colorado.	13,106.26
Fifteenth Cavalry	Two troops changing station Department of the Colorado	170.03
First Infantry	Regiment from Department of the Missouri to Department of California.	39,281.18
Do.....	One company from Department of the Missouri to Department of California.	2,544.61
Do.....	One company changing station, Department of the Missouri	458.36
Do.....	Three companies from Department of the Missouri to Department of the Colorado.	4,524.57
Do.....	Four companies from Department of the East to Department of the Missouri.	11,795.00
Second Infantry	Two companies changing station, Department of the Lakes	602.80
Do.....	Regiment from Department of the Lakes to Department of California.	15,609.04
Do.....	Regiment from Department of the East to Department of the Lakes.	7,468.61
Fifth Infantry	Regiment from Department of the Lakes to Department of California.	26,048.73
Do.....	Regiment from Department of the East to Department of the Lakes.	6,700.00
Seventh Infantry	One company from Department of the Columbia to Department of California.	598.96
Do.....	Two companies changing station, Department of the Columbia.	1,048.32
Do.....	Two companies from Department of the Columbia to Department of California.	861.37
Do.....	One company from Department of the Columbia to Department of California.	3,341.59
Eighth Infantry	Two companies changing station, Department of Dakota....	2,753.18
Do.....	Regiment from Department of Dakota to Department of California.	28,889.83
Do.....	Regiment from Department of the East to Department of the Lakes.	12,158.75
Do.....	Two companies from Department of the East to Department of Dakota.	2,043.20
Tenth Infantry	Two companies changing station, Department of the Missouri.	2,683.36
Do.....	One company from Department of the Missouri to Department of California.	3,222.19
Do.....	Three companies from Department of the Missouri to Department of the Colorado.	11,376.28
Do.....	Four companies from Department of the East to Department of the Colorado.	14,922.49
Do.....	Five companies from Department of the East to Department of the Missouri.	10,475.02
Do.....	Two companies from Department of the East to Department of the Colorado.	4,210.94
Eleventh Infantry	Two companies from Department of the East to Department of California.	10,026.82
Do.....	do.....	11,824.68
Do.....	Four companies changing station, Department of the East..	2,468.71
Do.....	One company changing station, Department of the East....	345.13
Do.....	Two companies changing station, Department of the East..	515.50
Do.....	Four companies from Department of the East to Department of California.	20,689.42

Principal movements of troops during the year—Continued.

Troops.	Movements.	Cost.
Fifteenth Infantry	Eight companies from Department of the East to Department of California.	\$15,066.72
Do.....	Three companies from Department of the East to Department of California.	12,745.40
Do.....	One company changing station, Department of the East....	457.00
Twenty-third Infantry	Four companies from Department of California to Department of the Colorado.	1,873.94
Do.....	One company changing station, Department of the Colorado.	2,667.50
Twenty-fourth Infantry	One company from Department of Dakota to Department of California.	1,736.00
Do.....	Two companies from Department of the Columbia to Department of California.	3,005.64
Twenty-fifth Infantry	Three companies from Department of Texas to Department of California.	10,908.17
Do.....	One company from Department of the Colorado to Department of California.	2,551.87
Twenty-seventh Infantry	Three companies changing station, Department of the East.	7,143.60
Thirtieth Infantry	Headquarters and band, Department of the Colorado to Department of California.	669.25
	Total.....	602,847.28

VESSELS OWNED BY THE QUARTERMASTER'S DEPARTMENT.

This Department has kept in service at points named, where constant use is required, 38 vessels, which it owns. The cost of maintaining these, including repairs, during the fiscal year 1901, was \$193,339.94. This statement is exclusive of transports purchased or chartered for transportation of troops and supplies between the United States and Cuba, Porto Rico, and the Philippines.

Name.	Class.	Tonnage.	When purchased or built.	Cost or estimated value.
General Hancock	Ferryboat	171.15	Apr. 1, 1898	\$31,165.00
General French	Propeller	155.52	Apr. 30, 1900	10,000.00
General McDowell	do	160	Nov. 17, 1886	56,150.00
General Meigs	do	175	May 11, 1892	64,436.43
Ordnance ¹	do	97	Sept. 1, 1883	27,870.80
Canby	Steam lighter	142	Dec. 7, 1898	36,000.00
Poe	do	157	Nov. 25, 1898	39,500.00
General Ayres	Steam tug	61	Mar. 23, 1900	6,500.00
General Barry	Propeller	56.15	Oct. 21, 1899	10,000.00
General Howe	do	75	Dec. 27, 1899	9,000.00
General Hunt	Steam tug	68	July 10, 1899	26,397.00
Captain Reilly	do	70.30	Nov. 14, 1879	17,947.46
General Jeff. C. Davis	Stern-wheel steamer	60	May 22, 1899	10,000.00
Eagle	Alco-vapor launch	8	July 29, 1896	4,950.00
Capron	Steam launch	3.15	Apr. 19, 1899	3,225.50
General De Russey	do	5	June 6, 1899	4,600.00
Colonel Elder	do	4.33	Dec. 31, 1898	2,500.00
Colonel Mendenhall	do	8.15	Feb. 6, 1899	3,225.50
Colonel Hamilton	do	3.15	Jan. 30, 1900	3,350.00
M. G. Kraysenbull	do	3.15	Dec. 16, 1898	3,225.50
Lillie	do	10.10	Mar. 13, 1899	1,850.00
Monroe	do	62.36	Nov. 30, 1875	15,200.00
Pleasanton	do	5	May 11, 1899	3,215.50
Thayer ²	do	32.36	Oct. 8, 1874	7,200.00
Colonel Ramsay	do	3.15	Sept. 11, 1899	3,275.00
Mercedes	do	5.50	Captured boat	.....
Kearney	Steam lighter	106	Feb. 5, 1899	4,000.00
Fremont	Steam launch	3.15	Mar. 20, 1899	3,300.00
Colonel Wikoff	Propeller	27	Jan. 16, 1901	9,900.00
Colonel Mitchell	Steam launch	7	June 11, 1901	7,225.00
Not yet named	do	10	Nov. 13, 1900	3,650.00
Do	do	5	Aug. 6, 1898	4,543.73
General Van Vleet	Stern-wheel steamer	140	Sept. 20, 1900	4,000.00
Haskell	Steam launch	3	June 30, 1900	3,946.00
Nordica	do	15	Oct. 16, 1899	2,500.00
Argo	Stern-wheel river steamer	39	July 7, 1899	2,500.00
Jane A. Falkenburg	American barkentine hull	295	Oct. 15, 1900	1,000.00
Captain Worden	Towboat	8.60	May —, 1901	4,250.00

¹ Transferred for exclusive use of Ordnance Department July 1, 1899.

² Under orders to be sold.

Name.	By whom employed.	Where.	Paid for repairs.	Running expenses.	Total expenses.
General Hancock.....	Quartermaster..	Governor's Island, N. Y.....	\$4,962.78	\$14,141.41	\$19,104.19
General French.....	do.....	Fort Barrancas, Fla.....	2,527.27	6,011.02	8,538.29
General McDowell.....	Chief quartermaster.	San Francisco, Cal.....	828.67	24,896.65	25,724.32
General Meigs.....	Depot quartermaster.	New York Harbor.....	667.56	14,900.42	15,567.98
Ordnance ¹	do.....	do.....	do.....	do.....	do.....
Canby.....	Depot quartermaster.	New York Harbor.....	3,574.55	11,809.00	15,383.55
Poe.....	Quartermaster..	Fort Morgan, Ala.....	862.88	6,465.78	7,328.66
General Ayres.....	do.....	Boston, Mass.....	1,551.64	5,899.53	7,451.17
General Barry.....	do.....	Fort Slocum, N. Y.....	3,165.00	4,428.00	7,593.00
General Howe.....	do.....	Sullivan's Island, S. C.....	1,968.19	2,961.59	4,929.78
General Hunt.....	do.....	Fort McHenry, Md.....	766.84	9,172.66	9,939.50
Captain Reilly.....	do.....	Fort Trumbull, Conn.....	1,774.85	7,948.41	9,723.26
Gen. Jeff. C. Davis.....	Chief quartermaster.	Fort St. Michael, Alaska.....	3,250.93	9,021.49	12,272.42
Eagle.....	Quartermaster..	Fort Hamilton, N. Y.....	125.00	16.25	141.25
Capron.....	do.....	Fort DuPont, Del.....	202.77	1,946.00	2,148.77
General De Russy.....	do.....	San Diego Barracks, Cal.....	184.44	2,884.18	3,068.62
Colonel Elder.....	do.....	Fort Screven, Ga.....	670.57	470.64	1,141.21
Colonel Mendenhall.....	do.....	Fort Barrancas, Fla.....	389.81	2,052.00	2,441.81
Colonel Hamilton.....	do.....	Fort Washington, Md.....	269.00	426.95	695.95
M. G. Krayenbull.....	do.....	Fort Monroe, Va.....	115.00	804.70	919.70
Lillie.....	do.....	Fort Lisum, Alaska.....	1,698.61	2,763.46	4,462.07
Monroe.....	do.....	Fort Adams, R. I.....	290.24	4,671.18	4,961.42
Pleasanton.....	do.....	Fort Dade, Fla.....	72.13	1,232.61	1,304.74
Thayer ²	do.....	Governors Island, N. Y.....	820.54	3,143.42	3,963.96
Colonel Ramsay.....	do.....	Fort Preble, Me.....	54.90	173.39	228.29
Mercedes.....	Depot quartermaster.	Washington, D. C.....	1,053.93	1,224.82	2,278.25
Kearney.....	Quartermaster..	Fort Dade, Fla.....	20.30	2,441.93	2,462.23
Fremont.....	do.....	Fort Fremont, S. C.....	150.19	830.35	980.54
Colonel Wilkoff.....	do.....	Governors Island, N. Y.....	2,342.50	1,615.85	3,958.35
Colonel Mitchell.....	Department commander.	do.....	50.00	296.06	346.06
Not yet named.....	Quartermaster..	Fort St. Philip, La.....	475.65	274.40	750.05
Do.....	do.....	Fort Morgan, Ala.....	do.....	do.....	do.....
General Van Vleet.....	Chief quartermaster.	Fort St. Michael, Alaska.....	1,954.21	4,856.06	6,809.26
Haskell.....	do.....	do.....	25.20	371.68	396.88
Nordica.....	do.....	do.....	425.82	3,799.59	4,225.40
Argo.....	Quartermaster..	Fort Gibbon, Alaska.....	190.00	1,910.00	2,100.00
Jane A. Falkenberg.....	Chief quartermaster.	Fort St. Michael, Alaska.....	do.....	do.....	do.....
Captain Worden.....	Quartermaster..	Fort Davis, Alaska.....	do.....	do.....	do.....
Total.....	do.....	do.....	do.....	do.....	193,339.94

¹ Transferred for exclusive use of Ordnance Department July 1, 1899.² Under orders to be sold.

ARMY TRANSPORT SERVICE.

At the beginning of the fiscal year the following-named vessels composed the army transport fleets, viz:

OWNED VESSELS ON THE ATLANTIC.

Name.	Class.	Tonnage.	Capacity.		Remarks.
			Officers.	Men.	
Burford.....	Troopship..	5,039	68	984	Being fitted for service, Pacific.
Burnside.....	do.....	2,194	31	178	Being fitted for service, Pacific, as cable ship.
Crook.....	do.....	4,126	91	870	Under orders for San Juan as dispatch boat.
Ingalls.....	do.....	1,847	31	182	
Kilpatrick.....	do.....	5,046	68	984	Being refitted for service, Pacific.
McClellan.....	do.....	3,006	75	180	
McPherson.....	do.....	3,699	113	626	
Rawlins.....	do.....	2,898	59	492	
Sedgwick.....	do.....	4,770	118	890	Out of commission.
Terry.....	do.....	1,338	100	317	
Wright.....	do.....	871	17	100	Being repaired for dispatch boat.

REPORT OF THE SECRETARY OF WAR.

OWNED VESSELS ON PACIFIC.

Name.	Class.	Tonnage.	Capacity.		Remarks.
			Officers.	Men.	
Egbert.....	Freight.....	2,845	20		Alaska service, temporarily.
Grant.....	Troopship...	5,590	82	1,827	
Hancock.....	do.....	5,164	67	1,062	
Lawton.....	do.....	3,497	61	663	Do.
Logan.....	do.....	5,672	146	1,650	
Meade.....	do.....	5,641	84	1,176	
Relief.....	Hospitalship	3,094	18	288	
Roeocrans.....	Troopship...	2,608	20	606	Do.
Seward.....	do.....	2,100	28	108	Dispatch boat, Alaska.
Sheridan.....	do.....	5,673	126	1,842	
Sherman.....	do.....	5,780	112	1,176	
Sumner.....	do.....	3,458	63	768	
Thomas.....	do.....	5,796	183	1,648	
Warren.....	do.....	4,375	53	1,239	

CHARTERED VESSELS ON THE PACIFIC.

Name.	Tonnage.	Class.	Date of charter.	Rate of charter per day.	Charter price reduced to following rate per day.	Remarks.
Indiana.....	2,484	Troopship...	June 8, 1898	125,000	Feb. 12, 1900, to \$600.	Still in service.
Pennsylvania..	3,166	do.....	July 7, 1898	125,000	Jan. 17, 1900, to \$600.	Discharged June 21, 1901.
Leelanaw.....	1,924	Animal ship.	April 14, 1899	600	Feb. 1, 1900, to \$350; June 4, 1900, to \$475.	Discharged Jan. 18, 1901.
Wyefield.....	5,200	do.....	June 12, 1899	650	May 1, 1900, to \$500.	Discharged Jan. 29, 1901.
Port Albert....	3,514	do.....	July 27, 1899	600	Aug. 1, 1900, to \$525.	Discharged Mar. 8, 1901.
Lennox.....	3,677	do.....	Sept. 29, 1899	700	Feb. 20, 1900, to \$650; June 22, 1900, to \$575.	Still in service.
Port Stephens..	3,554	do.....	Oct. 21, 1899	750	Mar. 9, 1900, to \$600; Aug. 1, 1900, to \$525.	Discharged Feb. 11, 1901.
Flintshire.....	3,815	do.....	Nov. 3, 1899	700	May 1, 1900, to \$500.	Discharged Oct. 1, 1900.
Westminster....	3,859	do.....	Apr. 20, 1900	450		Discharged Jan. 28, 1901.
Athenian.....	3,882	do.....	May 14, 1900	600		Discharged July 21, 1900.
Conemaugh.....	2,328	do.....	June 14, 1900	400		Discharged Jan. 22, 1901.

¹ Per month.

To meet the needs of the service in transporting troops, animals, and supplies to China, the Philippines, and Alaska, the following additional ships were chartered, viz:

Name.	Tonnage.	Class.	Date of charter.	Rate of charter per day.	Charter price reduced to following rate per day.	Remarks.
Pakling.....	4447	Animal ship..	1900. July 13	\$600	Feb. 21, 1901, to \$525.	Still in service.
Californian.....	8500	Freight ship..	July 16	600		Discharged Jan. 15, 1901.
Garonne.....	3901	Troop ship...	July 18	600		Discharged Apr. 30, 1901.
Kvarven.....	2463	Freight ship..	July 19	400		Discharged Nov. 13, 1900.
Athenian.....	3882	Animal ship..	July 21	500		Discharged Jan. 27, 1901.
Artec.....	3508	do.....	July 23	500		Discharged Mar. 18, 1901.
Artec(rechartered)	3508	do.....	1901. Mar. 23	400		Discharged June 25, 1901.
Almond Branch...	3461	Freight ship..	1900. July 26	400		Discharged Feb. 11, 1901.
Strathgyle.....	5023	Animal ship..	July 31	600		Discharged Dec. 27, 1900.

Name.	Ton- nage.	Class.	Date of charter.	Rate of charter per day.	Charter price reduced to following rate per day.	Remarks.
Universe	2585	Freight ship..	1900. Aug. 1	\$10,000	.....	Discharged Nov. 5, 1900.
Kintuck	4447	Animal ship..	Aug. 4	600	Mar. 15, 1901, to \$525.	Still in service.
Belgian King.....	3379	Freight ship..	.....do...	450	.....	Discharged Dec. 11, 1900.
Siam	3160	.....do.....	Aug. 11	450	.....	Discharged Nov. 26, 1900.
Federica.....	3561	Animal ship..	Aug. 13	560	.....	Discharged Jan. 29, 1901.
Argyle.....	2907	Freight ship..	Aug. 20	600	.....	Discharged Jan. 21, 1901.
Arab.....	4216	Animal ship..	.....do...	600	Mar. 23, 1901, to \$425.	Disabled at sea Apr. 5, 1901, when charter ceased.
Thyra	3406	.....do.....	Sept. 4	600	Mar. 26, 1901, to \$400.	Still in service.
Oopack	3883	.....do.....	Sept. 12	600	.....	Discharged May 2, 1901.
Algoa	7545	Freight ship..	Sept. 21	750	.....	Discharged Jan. 13, 1901.
Wilhelmina	4817	.....do.....	Sept. 26	700	.....	Discharged Feb. 11, 1901.
Buckingham	2879	.....do.....	Nov. 8	350	.....	Discharged Feb. 12, 1901.
Ohio.....	2072	Troop ship ..	1901. Apr. 3	600	.....	Discharged June 25, 1901.
Hyades.....	3700	Freight ship..	June 7	575	.....	Still in service.

¹ Per month.

On the chartered transports there were transported during the fiscal year 14,027 animals, of which number 392 died en route; 118,823 tons of military stores, and 768,478 miscellaneous packages.

During the year the transport fleet on the Pacific was increased by the purchase of a large steamship, the *Samoa*, to fill the need of a combined animal and freight transport, for which service this ship is admirably adapted, having a registered tonnage of 6,839, and a measured carrying capacity of over 11,000 tons.

The ship was purchased from Mr. Ansel L. White, of New York, at a price of \$425,000, of which sum \$25,000 was withheld for repairs to her boilers and renewing boiler tubes which, upon inspection prior to her purchase, it was found required to be done to put the vessel in good condition.

The vessel was delivered to the United States at Hongkong, China, and was sent from there to San Francisco, Cal., where, upon her arrival, it was found that the repair of her boilers and renewal of boiler tubes would cost \$7,450, and the balance of \$25,000, viz, \$17,550, was paid.

Owing to the conditions prevailing on the Pacific coast, due to the strike of the machinists, only such repairs as were necessary to make the vessel seaworthy and safe were made, and the transport was dispatched from Seattle May 29, 1901, to the Philippines with a load of forage and other supplies, amounting to 10,189 tons measurement.

The name of the vessel has been changed to *Dix*, in honor of Gen. John A. Dix.

It is intended to fit this transport to carry upon her upper and main deck 661 animals, which will leave space for carrying in addition 7,227 tons measurement of cargo. The stalls for the animals are to be arranged with a view to using the space they occupy with other freight when needed and not occupied by animals.

THE TRANSPORT SERVICE ON THE ATLANTIC.

At the beginning of the fiscal year there were 5 army transports engaged in transporting passengers and supplies between the United States and the West Indies, viz, the *Crook*, *McClellan*, *McPherson*, *Rawlins*, and *Sedgwick*. The army transports *Buford*, *Kilpatrick*,

and *Burnside*, which had been engaged in this service had been withdrawn and were being refitted and repaired for service on the Pacific.

The *Buford* was refitted as a troop transport, under a contract with the Newport News Shipbuilding and Dry Dock Company, of Newport News, Va., at a cost of \$397,637, and when completed had accommodations for 68 officers and 984 enlisted men, with an additional capacity for 2,764 tons of freight. The transport was completed, and sailed from New York for Manila, via the Suez Canal route, on November 7, 1900, with 25 officers, 953 enlisted men, 866 tons of freight, and 418 pieces of baggage and miscellaneous parcels, arriving at Manila December 29, 1900.

The transport *Kilpatrick* was refitted and repaired at a contract price of \$408,000, by the John N. Robins Company, of New York City, and when completed had accommodations for 68 officers, 984 enlisted men, and 2,764 tons of cargo. The vessel sailed from New York for Manila on November 13, 1900, with 23 officers, 930 enlisted men, 655 tons of freight, and 1,151 pieces of baggage and miscellaneous parcels, arriving at Manila January 3, 1901.

The transport *Burnside* was selected for service as a cable ship in the Philippine Islands for the signal department of the army, and for that purpose was fitted up under a contract with the Morse Iron Works Company, of New York, at a cost of \$130,000. As the work progressed, additional work not covered in the specifications under the contract was found necessary, and an expenditure of \$43,758.50 additional to the contract price was authorized. The manufacture and installation of the cable tanks and other apparatus necessary for the laying and repairing of the telegraph cable were done under the supervision and at the expense of the signal department.

The transport was completed, and sailed from New York for Manila, via the Suez Canal, on September 26, 1900, and arrived in Manila on December 6, 1900. She is still engaged in the work of laying and repairing cable as required, and when not thus engaged is used by the quartermaster's department for transport service around the Philippine Islands.

The army transport *Wright*, a small steamer which had been withdrawn from service as a dispatch boat to the commanding general at San Juan, and was in New York Harbor out of commission, being required for interisland service in the Philippines, was thoroughly repaired and sent to Manila, via Suez Canal. The contract for fitting and repairing the transport was entered into with the Atlantic Basin Iron Works, of New York, who were the lowest bidders for doing the work covered under the specifications on a percentage basis, their bid being 4.7 per cent on the original cost to them for the labor and materials for the work. The reports received show that there was expended for repairs and fitting the ship the sum of \$66,483.88.

The small coal capacity of the ship required that she sail via Bermuda and Madeira for coal. The vessel left New York January 22, 1901, and en route to Bermuda encountered a severe storm which caused some damage, requiring repairs to be made on her arrival there, at an expense of \$4,650.50. The *Wright* continued on her voyage and arrived in Manila on May 2, 1901. She carried 6 officers, 6 civilian employees, and 64 tons of freight.

The army transport *Ingalls*, another small steamer which had been

in service in the West Indies as an interisland transport and dispatch boat, was also sent to New York, and contract entered into with the John N. Robins Company for her repair and fitting up for interisland service in the Philippines at a cost of \$79,500. The work on the ship had not been completed at the close of the fiscal year.

The contract provided that the work should be completed in 62 working days and the ship delivered to the Government complete in every respect on June 17, 1901.

On June 14, 1901, while being drydocked by the contractors to receive her final coat of paint, the ship capsized, and the work of righting her and repairing the damage done was not completed at the close of the fiscal year.

The army transport *Terry*, which had been put out of commission and was lying in New York harbor, it was determined to offer for sale. A board of officers appointed to examine the vessel and fix a minimum price at which she should be sold reported her value for sale at \$40,000. Advertisement inviting proposals for her purchase was published, in response to which no proposals were received, and the vessel was still in possession of the Department at the close of the fiscal year and her final disposition undetermined.

The reduction of the military forces in the islands of Cuba and Porto Rico having caused greatly decreased demand for transportation of military passengers and supplies, the propriety of discontinuing the running of army transports between those islands and the United States was considered.

In response to an invitation for proposals to be submitted for transportation of military passengers, animals, and supplies between the United States and Cuba and Porto Rico, during the present fiscal year, bids were received from the several commercial steamship lines running to these islands, which were submitted to the Secretary of War for his approval, and awards were made to the lowest bidders for the service, and contracts entered into accordingly.

The army transports were therefore withdrawn from the service at the close of the fiscal year, and by direction of the Secretary of War the *Crook*, *Sedgwick*, and *McClellan*, after certain repairs were made upon them, were to be put out of commission and laid up in New York Harbor with only sufficient care takers on them to insure their safety. This was done with a view of reducing the expense and at the same time keeping the vessels in condition so they could be available for any emergency that might be required of them.

The army transport *Rawlins* being no longer required for the army-transport service, her disposition by sale or retransfer to the Navy Department was also under consideration. This vessel met with an accident while lying at her wharf in New York Harbor on April 10, 1901, loading with hay and other supplies for Cuba. A fire broke out in her hold, and to extinguish it the city fire department was called into service. The ship was flooded with water, which caused her to sink. A thorough investigation of the disaster failed to develop the cause of the fire. The vessel was raised by the Merritt & Chapman Derrick and Wrecking Company under a contract to pay them at a per diem rate for men and appliances used, with the provision that the total cost for the work was not to exceed \$20,000. The repairs of

damages sustained by the transport by reason of the accident amounted to about \$8,000.

The army transport *McPherson*, upon her voyage from New York to Cuba, with 3 officers, 111 enlisted men, and 25 civilian employees, and a general cargo of military supplies, in endeavoring to make the harbor of Matanzas on the morning of February 4, 1901, in a heavy fog, ran aground on the north coast of Cuba, about 8 miles west of Matanzas. Prompt measures were taken by the chief quartermaster at Havana to afford relief, sending a steam lighter and two tugs from Havana to endeavor to pull the vessel off. A heavy blow came up at night, which rendered all means at hand unavailing, and the ship's condition was such that it became necessary to employ the services of a wrecking firm with ample appliances to float the ship. The passengers were safely landed and the cargo was discharged on the shore, a portion of which was considerably damaged by water.

A contract was entered into with the Merritt & Chapman Derrick and Wrecking Company, of New York, to float the ship and deliver her in New York Harbor, the provisions of which were that they were to be paid the sum of \$70,000 if they succeeded in floating the ship and delivering her to the Department in New York Harbor, and in event of failure to deliver her they were to receive only \$5,000 for sending their outfit to the scene of the wreck and making the effort to save the ship.

The ship was floated by the contractors on June 2, 1901, and towed into Matanzas Harbor, from which port she left for New York on June 30, 1901, in tow of tugs belonging to the contractors.

The total movement during the fiscal year, of passengers, animals, and freight from the United States to Cuba has been 129 officers, 1,320 enlisted men, 2,084 civilians, 496 animals, 22,183 tons of freight, and 3,206 pieces of baggage and miscellaneous stores; from Cuba to the United States 265 officers, 5,277 enlisted men, 3,173 civilians, 239 animals, 3,334 tons of freight, and 2,810 pieces of baggage and miscellaneous parcels. From the United States to Porto Rico, 65 officers, 637 enlisted men, 449 civilians, 5 animals, 4,027 tons of freight, and 894 pieces of baggage and miscellaneous parcels; from Porto Rico to the United States, 83 officers, 1,555 enlisted men, 846 civilians, 312 animals, 1,188 tons of freight, and 835 pieces of baggage and miscellaneous parcels, a total movement of 15,883 passengers, 1,052 animals, 30,732 tons of freight, and 7,745 pieces of baggage and miscellaneous parcels during the fiscal year.

These figures include the transportation of 10 officers and 271 enlisted men of the Porto Rican Battalion from Porto Rico to Newport News, to be present at the inauguration ceremonies of the President on March 4 last, and their return to Porto Rico, and also the return to Cuba of the Cuban school-teachers in August, 1900, after completion of their instruction at Harvard University.

There were also transported from Cuba, for interment in the United States, the remains of 170 deceased officers and enlisted men of the Army and Navy and civilian employees.

From New York City to Manila there were transported on the army transports *Buford*, *Kilpatrick*, *Burnside*, and *Wright*, 57 officers, 1,895 enlisted men, 93 civilians, 2,150 tons of freight, and 1,608 pieces of baggage and miscellaneous parcels.

The following is a list of the tugs, lighters, and sloops in service on

the Atlantic at the beginning of the fiscal year, showing where they were employed, viz:

Name.	Class.	Where employed.
Ord	Tug	Manzanillo.
Reno	do	New York.
Reynolds	do	Havana.
Richardson	do	Matanzas.
Slocum	do	New York.
Gibbon	do	Havana.
Weitzel	do	Santiago.
Baker	Steam lighter	Havana.
Williams	do	Santiago.
Kearney	do	Cienfuegos.
Kanawha	Steam yacht	Havana.
Viking	do	Do.
Esperanza	Sloop	Gibara.
Miguel	do	Do.

During the fiscal year four of the above-named vessels were withdrawn from service in Cuba and ordered elsewhere, viz: The tugs *Reynolds* and *Weitzel* and steamer *Viking* to New York and the steam lighter *Kearney* to Fort Dade, Florida.

The tug *Slocum* was put in thorough repair in New York and was sent to San Francisco for service in that harbor. The tug left New York on July 12, 1900, and sailed via the Straits of Magellan, arriving in San Francisco on October 6, 1900, being eighty-six days en route.

As the contracts for transportation by commercial lines during the current fiscal year provides for delivery of all stores on shore, there is no need of retaining lighterage in the ports of delivery, and the disposition of the other small vessels in service in Cuba was being considered at the close of the fiscal year.

The expenditures for refitting and repairs of the owned vessels on the Atlantic during the fiscal year as reported amount to the sum of \$1,227,793.80.

ARMY TRANSPORT SERVICE ON THE PACIFIC.

At the beginning of the fiscal year the Department was actively engaged in forwarding troops, animals, and supplies to China, made necessary by the Boxer outbreak, which threatened to destroy the lives and property of all foreigners in certain portions of that Empire. The base of operations was established at Taku, a port in the Gulf of Pe-chili. Troops were early shipped to Taku from Manila upon army transports then in the Philippines. The Ninth U. S. Infantry, consisting of 39 officers and 1,271 enlisted men, sailed from Manila on June 27, 1900, on the army transport *Logan*, and arrived at Taku on July 6, 1900, being the first American troops to arrive on the ground. These were followed by the Fourteenth U. S. Infantry and Reilly's battery of artillery on the chartered transports *Indiana* and *Flintshire*, consisting of 31 officers and 1,189 enlisted men, and also 1 officer and 31 enlisted men of the Ninth U. S. Infantry and 4 officers and 22 enlisted men of other commands, a total movement on these two ships of 36 officers and 1,242 enlisted men from Manila to China.

The transports sailing from San Francisco and other ports on the Pacific coast with troops, animals, and supplies for China were given

orders to call en route at Nagasaki and other ports in Japan where orders awaited them as to whether to proceed to Taku or to Manila.

For the transportation of troops there were in service on the Pacific at the beginning of the fiscal year, eleven owned army transports and two chartered transports, the *Pennsylvania* and *Indiana*. Two of the owned transports, the *Lawton* and *Rosecrans*, were temporarily employed in the early part of the fiscal year transporting troops and supplies to Alaska, and the chartered transports *Pennsylvania* and *Indiana* were in service in the Philippines.

To meet the demands for transporting troops to the Orient, for service in China if necessary, an additional steamship was chartered, viz, the *Garonne*, and fitted up for the accommodation of 21 officers and 745 enlisted men of the First U. S. Cavalry, which sailed from Seattle for Taku on August 7, 1900.

Upon arrival of the *Garonne* at Nagasaki the troops on board destined for China were disembarked and the ship proceeded to Manila and was retained in service in the Philippine waters until her return to the United States with volunteer troops in April, 1901, when she was discharged from service.

The movement of troops from San Francisco for service in China, if necessary, was made on the army transports *Sumner* and *Meade*, with the Fifteenth U. S. Infantry and Third U. S. Cavalry; the *Hancock*, with the Third U. S. Artillery; the *Warren*, with two battalions Ninth U. S. Cavalry; the *Logan*, with parts of the First and Second U. S. Infantry; the *Thomas*, with parts of the Fifth and Eighth U. S. Infantry; the *Grant*, with two battalions of the Sixth U. S. Artillery; the *Sherman*, with parts of the Second, Fifth, and Eighth U. S. Infantry, and the *Rosecrans*, with one battery Seventh U. S. Artillery and recruits, a total movement of 259 officers and 8,553 enlisted men.

For the transportation of the volunteer army serving in the Philippines whose term of enlistment expired under provisions of law on June 30, 1901, the Department made ample preparation.

It was anticipated early in the year that this movement might commence in November, 1900, and be conducted without seriously interfering with the schedule of regular sailings of the transports between San Francisco and the Philippines, by adding to the sailings such of the transports as were not on the regular schedule.

The delay in providing an army to replace the volunteers caused a delay in commencing the movement of the troops as organizations until January 10, 1901, when the first regiment left Manila. Such of the sick as were able to make the voyage were, however, sent by transports sailing from Manila in December, 1900.

The following is a list of the transports upon which the troops were transported, showing their designation, number of officers and enlisted men, dates of sailing and of arrival in the United States.

Name of transport.	Designation of troops.	Number.		Total.	Date of sailings.	Date of arrival in United States.
		Off-icers.	Men.			
<i>Sherman</i>	Sick.....	.....	.....	500	Dec. 15, 1900	Jan. 7, 1901
<i>Warren</i>	do.....	.....	.....	500	Dec. 30, 1900	Feb. 2, 1901
<i>Sheridan</i>	Thirty-seventh Infantry.....	27	648	675	Jan. 10, 1901	Feb. 6, 1901
<i>Indiana</i>	Sick.....	.....	.....	270	.....	.....
<i>do.</i>	do.....	.....	.....	500	Jan. 23, 1901	Feb. 27, 1901
<i>Pennsylvania</i>	Thirty-sixth Infantry.....	15	487	502	Jan. 28, 1901	Mar. 2, 1901
<i>Meade</i>	Eleventh Cavalry.....	24	566	590	Feb. 1, 1901	Mar. 1, 1901
<i>Suford</i>	Twenty-seventh Infantry.....	27	856	982	Feb. 10, 1901	Mar. 13, 1901

Name of transport.	Destination of troops.	Number.		Total.	Date of sail-ings.	Date of ar-ival in United States.
		Offi-cers.	Men.			
Hancock	Thirtieth Infantry	26	751	777	Feb. 17, 1901	Mar. 12, 1901
Kilpatrick	do.		9	9	do.	Mar. 17, 1901
Logan	Sick.			400		
Logan	Thirty-third Infantry	26	769	795	Mar. 1, 1901	Mar. 29, 1901
Garonne	Thirty-fourth Infantry	21	785	806	Mar. 9, 1901	Apr. 20, 1901
Thomas	Twenty-sixth Infantry	41	849	890	Mar. 16, 1901	Apr. 14, 1901
Rosecrans	Twenty-eighth and Thirty-fifth Infantry.	72	1,846	1,918	do.	Apr. 17, 1901
Lawton	Thirty-ninth Infantry	23	642	665		Do.
Grant	Twenty-ninth Infantry	31	866	897	Mar. 23, 1901	Apr. 19, 1901
	Thirty-second Infantry	24	666	690		
	Twenty-sixth Infantry	2	79	81		
	Sick.			126		
Sheridan	Forty-fifth Infantry	33	969	992	Apr. 22, 1901	May 17, 1901
Hancock	Forty-sixth Infantry	33	864	897		
Buford	Forty-first Infantry	32	1,040	1,072	May 18, 1901	June 9, 1901
Pennsylvania	Forty-first Infantry	20	898	918	do.	June 26, 1901
Aztec	Fortieth Infantry	32	910	942	May 22, 1901	June 17, 1901
Kintuck	Forty-second Infantry	2	62	64	May 18, 1901	June 19, 1901
	do.	2	54	56	May 26, 1901	June 29, 1901
Thomas	Forty-seventh Infantry	33	971	1,004		
	Forty-ninth Infantry	14	361	375	May 27, 1901	June 26, 1901
Ohio	Thirty-eighth Infantry	10	272	282		
Logan	Forty-second Infantry	29	749	778	May 29, 1901	June 21, 1901
	Thirty-eighth Infantry	21	575	596	May 31, 1901	June 25, 1901
Thyra	Forty-fourth Infantry	37	1,062	1,099		
Grant	Thirty-eighth Infantry	3	78	81	June 1, 1901	June 29, 1901
Kilpatrick	Forty-eighth Infantry	38	1,094	1,132	do.	June 24, 1901
	Forty-ninth Infantry	29	729	758		
	Forty-third Infantry	33	1,011	1,044	June 4, 1901	June 27, 1901
Total officers and enlisted men.				24,663		

The movement of troops from the United States to take the place of the return Volunteer Army in the Philippines commenced on October 1, 1900, by the transportation of a part of the Twenty-fourth and Twenty-fifth U. S. Infantry, and the next shipment was not made until February 16, 1901.

The following is a statement showing the transports, designation of troops, number of officers and men, and dates of sailings from San Francisco, viz:

Name.	Designation of troops on board.	Number.		Date of sail- ing.
		Officers.	Men.	
Hancock	Twenty-fourth and Twenty-fifth Infantry	13	909	Oct. 1, 1900
Sheridan	Twenty-sixth and Twenty-seventh Infantry.	22	1,197	Feb. 16, 1901
Indiana	First Battalion, Twenty-eighth Infantry	9	585	Mar. 15, 1901
Pennsylvania	Company D, Tenth Infantry		145	
Meade	Six companies, Tenth Infantry	10	863	Mar. 18, 1901
	Headquarters and two squads, Fifth Cavalry.	17	719	Do.
Hancock	Two troops, Fifteenth Cavalry		199	
	Two squads, Sixth Cavalry	7	327	Mar. 25, 1901
Buford	Depot battalion, Seventh Infantry	7	550	
	Depot battalion, Fifth Infantry	7	500	Apr. 1, 1901
	Two troops, Fifteenth Cavalry	2	137	
Kilpatrick	Eleventh Infantry	5	819	
	Fifteenth Cavalry	1	97	Apr. 5, 1901
	First Infantry	5	271	
	Tenth Infantry	2	150	
Logan	Third Squadron, Ninth Cavalry	6	324	Apr. 15, 1901
	Second Squadron, Tenth Cavalry	8	338	
	Battalion, Eleventh Infantry	10	545	
Ohio	Two companies, First Infantry	3	272	Apr. 16, 1901
Lawton	One battalion, Thirtieth Infantry	9	570	May 25, 1901
Hancock	Eleventh Infantry	7	243	June 25, 1901
	Engineer Corps	14	403	
Total		164	9,718	

A, total of 9,882 officers and enlisted men transported.

At the beginning of the fiscal year the fleet of transports on the Pacific available for the transportation of troops consisted of eleven owned vessels and two chartered steamships, the *Indiana* and *Pennsylvania*, with combined accommodations for 1,043 officers and 16,135 enlisted men.

The steamship *Garonne* was subsequently chartered and fitted up with accommodations for 41 officers and 849 enlisted men. This ship was retained in the service in the Philippines to be ready to bring a load of volunteers to the United States when the movement commenced.

The army transports *Buford* and *Kilpatrick*, which had been fitted up in New York with accommodations for 136 officers and 1,968 enlisted men and sent to Manila, were also added to the fleet. The total number of troops which could be transported by the combined fleet on one trip of each of the transports was 1,220 officers and 18,952 enlisted men.

As the term of service of the volunteer troops expired on June 30, 1901, and their return to the United States was delayed until after the beginning of the present calendar year, it was found necessary to charter one additional ship in order to deliver all the troops to the United States on or before June 30, 1901.

The steamship *Ohio*, which had formerly been employed in transporting troops, was again chartered in April, 1901, at \$600 per day, and upon reasonable terms was fitted up by her owners in San Francisco for the accommodation of 38 officers and 781 enlisted men and dispatched to Manila for a load of troops.

With the use of three animal transports—the *Aztec*, *Kintuck*, and *Thyra*—each bringing one company of troops, the volunteers were all landed in the United States prior to June 30, 1901.

TRANSPORTATION OF ANIMALS AND SUPPLIES ON THE PACIFIC.

The increase of the army serving in the Philippines and China caused an increased demand for the transportation of animals for the cavalry and artillery and for means of transportation of forage for the animals and supplies and equipment for the troops. To provide these for the army serving in China during the approaching winter it was necessary that shipments be made as early as possible in anticipation of the early closing of navigation in the Gulf of Pechili by ice, it being reported that this usually occurred as early as November 15.

The fleet of chartered transports fitted for the transportation of animals at the beginning of the fiscal year consisted of 9 steamships. This fleet was subsequently increased by the charter and fitting up of 8 animal transports, and 9 other steamships were chartered for the transportation to China of military supplies, making in all a fleet of 26 chartered transports, with a combined carrying capacity of 8,868 animals and 41,687 tons of supplies.

In addition to the ships chartered for carrying supplies to the Philippines and China, 9 vessels were employed during the year at tonnage rates and 1 vessel at a trip rate. The prices paid for this service have been from \$6 to \$7 per ton, which is a considerable reduction from the prices paid in previous years, when \$10 to \$13 per ton were demanded and paid for such service.

There were transported by these vessels 50,377 tons of stores, consisting of forage, lumber, subsistence, and miscellaneous supplies.

The transportation of animals on the long voyage from the Pacific coast to the Philippines and China was conducted without great loss; in fact, with one exception, no serious loss of life occurred among the animals on board the transports.

The chartered transport *Leelanaw* sailed from San Francisco for Manila on October 10, 1900, with 14 horses and 236 mules on board. En route to Honolulu 3 mules died of pneumonia, about 40 cases of the disease having developed among the mules on the voyage. The ship arrived at Honolulu October 21, 1900, where the animals were unloaded for rest and recuperation. The animals were reloaded on October 26, 1900, deaths by disease having reduced the number of mules on board to 230, and the ship resumed her voyage on that date. On November 15, 1900, the ship encountered a severe storm, which continued in great fury until November 17, 1900, when it became possible to enter the holds where the animals were, when it was found that of the several animals remaining alive all had received injuries requiring them to be put to death, except 1 mule.

The transport quartermaster in charge of the cargo reports that the loss of his cargo was in no sense due to any structural weakness in the fittings of the ship, the stalls being found practically intact and the sideboards in place after the storm abated, and that no human foresight or precaution could avail when animals happen to be exposed to a storm of such severity.

The experience of the past three years in the transportation of animals on the long voyage across the Pacific has enabled the Department to perfect a system for fitting up ships which insures the greatest safety and comfort of the animals.

Several of the cargoes shipped from the Pacific coast have been landed in Manila without being unloaded en-route, and the animals have shown increase of flesh during their long voyage, and upon arrival were ready to be put to work after a day or two of rest.

REPAIRS OF TRANSPORTS.

The army transport *Sheridan*, which was undergoing repair and structural strengthening at San Francisco at the beginning of the fiscal year, was completed and again put in commission, sailing from San Francisco on November 16, 1900.

The transport *Sherman* was put out of commission on her arrival in San Francisco on January 7, 1901, and a contract entered into for work required to be done on her with the Union Iron Works of San Francisco for the sum of \$335,497.50. This work included the structural strengthening of the ship, the renewal of her decks with teak wood, and putting her hull and machinery in perfect condition. An additional sum of \$33,244 has been authorized expended for building a new lavatory and ice house, and making other changes and repairs on the ship not included in the original contract.

The strike among the mechanics and laboring classes prevailing in San Francisco has prevented the completion of the work on the ship, which was still in the hands of the contractors at the close of the fiscal year.

The long voyages from San Francisco to Manila and return, the return voyage being made with little or no cargo in the holds of the transports, are exceedingly trying to the machinery and other parts

of the vessels, and upon arrival in San Francisco it is usually found that more or less work is necessary to be done to put them in condition for the safe and comfortable transportation of passengers.

Every precaution is taken to keep the expenditure for repairs to the transports down to a minimum, a board being appointed to inspect and report upon every item of repair called for, which is submitted to this office, and when approved and authorized by the War Department the work of repair is awarded to the lowest responsible bidder for doing it.

The total expenditure on the Pacific coast during the fiscal year for refitting and repairing of owned transports, as reported, amounts to \$1,563,421.86, and for the fitting up of the chartered transports and repairs made to the fittings there is reported as expended the sum of \$570,822.32.

ARMY TRANSPORT SERVICE IN THE PHILIPPINES.

The report of the chief quartermaster at Manila shows that there were purchased during the year for service of the quartermaster's department in the Philippine Islands 1 steamship, the *Kong See*, renamed *Liscum*, for the sum of \$60,000; 2 lighters, costing \$10,875; 8 launches, costing \$64,750; 2 lorchas, costing \$11,250, and 66 rowboats and lifeboats, costing \$8,307.50, a total expenditure of \$155,182.50. Also that there have been hired and chartered during the year 32 steamers and 14 small vessels, at a total expenditure of \$746,596.35.

There were in service in the Philippines during the fiscal year the following number of vessels of the classes named, owned by the department, viz:

Steamships	5
Stern-wheel steamboats	2
River gunboats	5
Steam lighters	9
Steam tugs	38
Lighters	14
Launches	18
Coal hulks	3

The report also shows that there have been expended for repairs to these vessels the sum of \$328,117.30.

The above statement of vessels includes the army transport *Wright*, a small steamship fitted up in New York and sent to Manila, where she arrived on May 2, 1901.

In addition to these vessels the chartered troopships *Pennsylvania*, *Indiana*, and *Garonne* have been employed in transporting troops and supplies around the islands the greater part of the fiscal year.

The following is a list of the army transports in service at the close of the fiscal year, showing their tonnage, capacity, and where employed, viz:

Name.	Tonnage.	Capacity.		Cargo capacity with troops.	Where employed.
		Officers.	Men.		
Buford	5,089	68	984	<i>Tons.</i> 2,764	Pacific fleet.
Burnside	2,194	31	178	1,006	Do.
Crook	4,126	91	870	2,867	Atlantic fleet.
Dix	6,839	12	.....	9,939	Pacific fleet.
Egbert	2,845	20	.....	3,237	Do.
Grant	5,590	82	1,827	1,887	Do.
Hancock	5,164	67	1,062	2,160	Do.

Name.	Capacity.		Cargo capacity with troops.	Where employed.
	Tonnage.	Officers.	Men.	
Ingalls	1,347	31	182	<i>Tons.</i> 588 In New York, being fitted for Pacific.
Kilpatrick	5,046	68	984	2,764 Pacific fleet.
Lawton	3,497	61	663	1,288 Do.
Logan	5,672	146	1,650	1,766 Do.
McClellan	3,006	75	180	2,156 Atlantic fleet.
McPherson	3,699	113	626	1,533 Do.
Meade	5,641	88	1,176	1,376 Pacific fleet.
Rawlins	2,896	59	492	425 Atlantic fleet.
Relief	3,094	18	288	978 Pacific fleet.
Rosecrans	2,608	20	606	2,066 Do.
Sedgwick	4,770	118	890	906 Atlantic fleet.
Seward	2,100	28	108	740 Pacific fleet.
Sheridan	5,673	126	1,842	1,744 Do.
Sherman	5,780	112	1,776	1,810 Do.
Sumner	3,458	63	768	811 Do.
Terry	1,338	100	240	..... Out of commission, in New York.
Wright	871	17	100	154 Pacific fleet.
Thomas	5,796	133	1,648	1,984 Do.
Warren	4,375	53	1,239	1,000 Do.

In my last annual report mention was made of the purchase of two sailing vessels, the *St. Mark* and *Cyrus Wakefield*, to be sent to Manila for use in that harbor as coal hulks, one hulk being already in service there.

The ship *Cyrus Wakefield* was purchased in San Francisco in September, 1900, for the sum of \$45,000.

The *St. Mark* sailed from Norfolk, Va., on July 11, 1900, with a load of coal on board, arriving in Manila on December 20, 1900. The *Cyrus Wakefield* was sent to Nanaimo, British Columbia, from which port she sailed for Manila on October 2, 1900, with a load of coal, and arrived safely in Manila, where both vessels are now employed as hulks for storage of coal for the transports in that harbor. The three ships are designated Coal Hulks Nos. 1, 2, and 3, respectively.

The hospital ship *Relief* has been in service in the Philippines during the fiscal year, transporting sick and disabled soldiers from the various ports in the islands to Manila.

The ship made one voyage to Taku, China, bringing to Nagasaki sick and wounded soldiers from the army serving in China, arriving at Nagasaki on September 20, 1900. The ship remained in Nagasaki until November 21, 1900, undergoing repairs, costing, as reported, the sum of \$39,000.

The invalid soldiers in the Orient, who have been returned to the United States during the year, were transported on the troop transports, on which there are ample hospital accommodations for the treatment and comfort of the sick while en route.

DEPARTMENT OF ALASKA.

Prior to the beginning of the fiscal year the troops detailed for service in the department of Alaska were dispatched from Seattle on the army transports *Rosecrans* and *Lawton*. These transports also carried a full cargo of military supplies, and the army transport *Egbert* and chartered transport *Athenian* also carried each a general cargo of materials and supplies for the garrisons to be established in that department.

The steamer *Seward*, which had been purchased for service as a dis-

patch boat for the department commander, sailed from Seattle for St. Michael on September 3, with a full cargo of lumber and miscellaneous military stores.

The steamship *Kvarven* was also chartered and made two voyages from Seattle to Alaska, with coal, lumber, and other supplies in July and September, 1900, respectively. Upon arrival at St. Michael on her last voyage the season was far advanced, and on account of a severe storm prevailing the discharge of her cargo was interrupted. After discharging a small quantity of the coal from the ship ice began forming in the harbor, threatening to prevent the vessel's return, and she accordingly sailed back to Seattle with the greater portion of her cargo on board.

The army transport *Lacton*, upon her return from Alaska to Seattle from her first voyage, made in June, 1900, subsequently made two voyages to Alaska, one in July and another in September, 1900, and returned to Seattle, bringing 827 citizens, of which number 775 were in destitute circumstances.

Prior to the close of the fiscal year the army transports *Rosecrans*, *Warren*, and *Egbert* were sent from San Francisco to Seattle to meet the needs for transportation to Alaska during the present season.

The transport *Warren* left Seattle for St. Michael on June 8, 1901, with 3 officers, 45 enlisted men, and 26 civilians, 1,502 tons of supplies, and 46,353 feet of lumber on board.

On June 19, 1901, the chartered transport *Hyades* also sailed from Seattle for St. Michael with a cargo of supplies, including 2,275 tons of forage, coal, and miscellaneous stores, and 724,124 feet of lumber.

The dispatch boat *Seward*, which had been returned to Seattle before the close of navigation in Alaska in the fall of 1900 to winter in Puget Sound, sailed from Seattle to St. Michael on June 10, 1901, with 13 passengers, 415 tons of supplies, and 75,209 feet of lumber.

The total shipment to Alaska this season prior to the close of the fiscal year was 87 passengers, 4,192 tons of freight, and 845,686 feet of lumber.

The army transports *Rosecrans* and *Egbert*, at the close of the fiscal year, were undergoing repairs at the Bremerton Navy-Yard in Puget Sound preparatory for service in transporting troops and supplies to Alaska.

The total movement of passengers and freight to Alaska by owned and chartered transports during the fiscal year has been 165 passengers, 10,256 tons of supplies, and 1,081,558 feet of lumber, and from Alaska to Seattle 827 passengers.

On commercial lines, at tonnage rates, there have been transported 109,105 feet of lumber, 4,598 tons of freight, and 25 animals at an agreed rate per head.

A summary of the reports received shows that the expenditures during the fiscal year for the purchase, charter and hire, fitting up, and repairing of owned and chartered transports have been as follows:

For purchase of vessels	\$659, 070. 64
For fitting and repairing owned vessels in the United States and at foreign ports	3, 190, 087. 84
For charter of vessels	3, 744, 440. 30
For fitting up chartered vessels and restoring them on termination of charter	768, 638. 27
For tonnage hire of vessels	459, 420. 62
Total	8, 821, 657. 67

The total movement of passengers has been as follows:

From the United States to Cuba.....	3, 533
From Cuba to the United States.....	8, 715
From the United States to Porto Rico.....	1, 151
From Porto Rico to the United States.....	2, 484
From the United States to the Philippines and China and intermediate ports..	29, 832
From the Philippines and intermediate ports to the United States.....	32, 518
From the United States to Alaska.....	165
From Alaska to the United States.....	827
To and from the Philippines and China, about.....	7, 250
To and from ports in the Philippine Islands, from April 1, 1901 to June 30, 1901,	40, 124
Total	126, 599

The above statement of passengers transported to and from ports in the Philippines covers a period of three months, from April 1 to June 30, 1901, the only time accounted for in the reports received. The transportation of passengers in the Philippines during the preceding nine months of the fiscal year consisted of the movement of troops from one port to another, in changing of stations, or for service as the military operations required.

There were also brought to the United States from Cuba and the Philippine Islands, China, Nagasaki, Honolulu, and Guam, the remains of 1,825 officers, enlisted men, and civilian employees for reinterment in this country.

The number of animals transported during the year was as follows:

From the United States to Cuba.....	496
From Cuba to the United States.....	239
From the United States to Porto Rico.....	5
From Porto Rico to the United States.....	312
From the United States to the Philippines and China.....	14, 033
From the United States to Alaska.....	25
From Manila to China and return to Manila.....	1, 262
From Manila to other ports in the islands.....	2, 623
Total	18, 995

The shipment of military supplies and miscellaneous stores during the fiscal year has been:

	Tons.	Packages.
From the United States to Cuba.....	22, 183	3, 206
From Cuba to the United States.....	3, 334	2, 810
From the United States to Porto Rico.....	4, 027	894
From Porto Rico to the United States.....	1, 188	835
From the United States to the Philippines and China and intermediate ports..	224, 908	1, 456, 969
From the Philippines and intermediate ports to the United States.....	3, 385	15, 383
From the United States to Alaska.....	17, 235	
From the Philippines to China and return.....	2, 500	
To and from ports in the Philippines from April 1, 1901 to June 30, 1901		728, 156
Total.....	278, 760	2, 208, 253

In addition there were transported to and from the United States 1,151,560 pounds of mail matter and \$8,339,750 in money.

The important movements of armies during the year, viz, the army sent to China, the Volunteer Army returned from the Philippines to the United States, and the army from the United States and China to replace the returned volunteers, together with the transpor-

tation of the immense quantities of military stores, including small arms, field and siege guns and their ammunition, camp equipage, subsistence supplies for men and beasts, and the animals and wagons required for the transportation of these stores on land, necessary for the successful operations of armies in the field, has entailed a vast amount of labor in promptly and successfully providing the means for transporting these large bodies of troops.

That there might be no delay in meeting the needs of the military service at all points the utmost vigilance, care, and foresight has been required on the part of the officers and men intrusted with the conduct of the army transport service. It is gratifying to report that no disaster has occurred to mar the successful conduct of the service, and not a human life has been lost through any defect in the provisions made for these large movements of troops by sea.

CHAR. BIRD.

*Deputy Quartermaster-General, U. S. A.,
Chief of Transportation Division.*

The QUARTERMASTER-GENERAL, U. S. A.

AUGUST 15, 1901.

GENERAL: I herewith have the honor to submit the annual report of the operations of the clothing and equipage supply branch of this office for the fiscal year ended June 30, 1901:

FINANCIAL.

The annual appropriation for clothing and equipage for fiscal year ending June 30, 1901	\$8,500,000.00
Deficiency appropriation, act of Congress approved March 3, 1901 ...	1,500,000.00
Credits during the past fiscal year:	
Reimbursements on account of issues to the militia of the States and Territories.....	315,205.85
Collections by Pay Department on account of clothing drawn by the enlisted men in excess of their allowance; also from sales to officers, to the militia, surveying expeditions, and other miscellaneous and duly authorized sales.....	636,273.68
Total.....	10,951,479.53
The remittances to officers of the Quartermaster's Department, at the general depots and elsewhere, for the purchase and manufacture of clothing and equipage and other expenditures, chargeable to the clothing and equipage appropriation, amounted to	\$9,383,846.25
Settlements made at Treasury of claims and accounts..	7,596.61
	9,391,442.86
Leaving a balance of.....	1,560,036.67

in the Treasury of the United States on the 30th of June, 1901, which will be further drawn upon to pay the outstanding indebtedness incurred prior to the close of the fiscal year.

REMITTANCES.

The following is a statement showing the remittances from the appropriation for clothing and equipage during the last fiscal year, viz:

Depot at Philadelphia, Pa.....	\$4, 157, 179. 80
Depot at New York.....	1, 676, 031. 86
Depot at San Francisco, Cal.....	1, 413, 302. 06
Depot at Jeffersonville, Ind.....	302, 660. 11
Depot at Washington, D. C.....	46, 500. 00
Depot at St. Louis, Mo.....	16, 399. 57
Chief quartermaster, Department of the East (including Boston depot).....	1, 031, 856. 11
Chief quartermaster, Department of the Lakes.....	663, 681. 02
Chief quartermaster, Department of California.....	16, 804. 80
Other departments, depots, posts, and disbursing stations.....	59, 430. 92
Total.....	9, 383, 846. 25

COLLECTIONS AND DISBURSEMENTS BY PAY DEPARTMENT.

There were collected by the Pay Department from the enlisted men of the Army from April 1, 1900 (the date referred to in my last annual report), to March 31, 1901, on account of clothing drawn in excess of their allowance, the sum of \$235,845.68, all of which is credited to the appropriation for clothing and equipage.

Said department also paid to the enlisted men during the same period, upon their discharge from the service, on account of clothing undrawn (savings), the total sum of \$534,581.40.

Comparison again demonstrates that the established clothing allowances, both in money and in kind, are more than sufficient. Recent reports received from the Philippines fully confirm this.

STATUS OF CLOTHING AND EQUIPAGE SUPPLIES.

Statement A, herewith, shows in a consolidated form and in great detail the various articles of clothing and equipage supplies on hand at the general depots of the Quartermaster's Department in the United States on July 1, 1900, the quantities purchased, manufactured, sold, and issued to the Army at home and in Cuba, Hawaii, and the Philippine Archipelago; also the issues to the several governors of the States and Territories for use of the militia during the last fiscal year, and the quantities remaining on hand June 30, 1901.

Statement B, accompanying this report, shows in detail the quantities of clothing and equipage supplies on hand at depots in the Philippines, Porto Rico, Cuba, and Hawaii July 1, 1900, quantities purchased, sold, and issued to the troops in said islands during the past fiscal year, and the quantities remaining on hand for issue on the 30th of June, 1901.

Statement C, herewith, shows in detail the articles of clothing pertaining to the United States Army Transport Service, which were on hand at the San Francisco and New York depots June 30, 1900, the quantities purchased and received, sold, and issued to the transport service; also quantities remaining in depot June 30, 1901.

PURCHASES AND MANUFACTURES FOR THE ARMY.

The following is a statement of the articles of clothing, equipage, and materials purchased and manufactured during the last fiscal year at the general depots of the Quartermaster's Department, viz:

IN THE UNITED STATES.

Purchases.

Blankets, woolen	109,820	Ax helves	8,002
Cape:		Books, all kinds	3,985
Forage	84,708	Brooms, corn	16,599
Muskrat	30,016	Brushes, scrubbing	41,285
Collars, linen	120,000	Chairs, barrack	11,003
Drawers:		Cots, field	75,303
Jeans	377,409	Flags, all kinds	9,902
Knit wool	105,345	Hatchets	3,000
Nainsook	75,348	Hatchet helves	7,524
Nankeen	153,312	Kettles, camp	5,000
Gauntlets:		Litters, hand	2,521
Buckskin	41,552	Mattresses	6,000
Muskrat	28,500	Mattress covers	21,679
Gloves, Berlin	482,294	Mosquito bars	40,168
Hats, campaign:		Shovels, long handled	5,000
With ventilators	364,423	Shovels, short handled	5,005
Without ventilators	15,074	Spades	5,000
Hat cords	296,082	Tent pins, all kinds	518,169
Hat ornaments	419,177	Tent poles, shelter	96,200
Leggins	561,813	Trumpets	1,354
Overshoes	27,372	Whistles	5,500
Shirts:		Buttons, all kinds	9,411,696
Chambray and gingham ..	402,220	Cloth, facing	17,501
Muslin	74,775	Drilling	208,622
Shoes:		Duck:	
Black	299,096	Brown	212,765
Russet	582,359	Tent	917,349
Stockings:		Flannel:	
Cotton	3,227,397	Blouse	214,725
Woolen	598,216	Blouse lining	67,729
Suspenders	37,500	Canton	310,641
Undershirts:		Overcoat lining	167,939
Cotton	658,752	Shirting	683,949
Knit wool	150,089	Kersey, all kinds	299,750
Nainsook	60,876	Khaki material	4,222,201
Nankeen	159,830	Khaki shirting	137,426
Waist belts	66,024	Muslin	62,079
Axes	2,500	Petroleum paper	15,000

Manufactures.

Articles.	Depot.			
	Philadel- phia.	Jefferson- ville.	San Fran- cisco.	New York.
Blouses:				
Made	23,621	76,632	27,371	
Unmade	9,344	3,415	4,624	
Canvas fatigue coats	6,150			
Canvas fatigue trousers	3,431		8,193	
Caps, canvas	21,874			
Chevrons, all kinds	123,585		8,003	
Drawers, cotton flannel	23,160	111,000	42,675	
Dress coats	203		71	
Khaki coats	6,804			424,863

Manufactures—Continued.

Articles.	Depot.			
	Philadel- phia.	Jefferson- ville.	San Fran- cisco.	New York.
Khaki trousers.....pairs..	7,023			783,835
Mittens, canvas.....do..	3,100			
Overalls.....do..	6,020	2,000	5,860	
Overcoats:				
Canvas, blanket-lined.....	4,139			
Kersey.....	54,011		320	
Shirts:				
Flannel.....	88,516	133,674	65,913	
Khaki, cotton.....	17,508			
Stable frocks.....	4,800	6,735		
Summer coats.....	1,078			
Summer trousers.....pairs..	1,071			
Trousers, kersey:				
Foot.....do..	103,683		16,215	
Mounted.....do..	29,592		8,861	
Trousers stripes, all kinds.....	24,172		10,774	
Barrack bags.....	8,300			
Bed sacks.....		25,000		
Bed sheets.....			9,900	
Tents:				
Common.....	2,483			
Conical wall.....	1,780			
Hospital.....	62			
Shelter halves.....	54,554			
Wall.....	4,366			

No purchases of clothing and equipage supplies were made either in the Philippines, Cuba, Porto Rico, or Hawaii.

CLOTHING PURCHASED FOR TROOPS IN ALASKA.

The following is a statement showing the quantities of the several kinds of arctic clothing that were purchased during the last fiscal year for use of troops in the Department of Alaska:

Boots, rubber:	
Hip.....pairs..	515
Knee.....do..	1,397
Buckskin gloves.....do..	131
Buckskin mittens.....do..	314
Canvas jackets, wool lined.....	20
Canvas blanket-lined pea-jackets.....	1,000
Canvas blanket-lined trousers.....pairs..	1,000
Caps, fur.....	417
Drawers, wool, fleece-lined.....pairs..	4,930
Felt shoes.....do..	2,028
Felt soles.....do..	100
Kenwood sleeping bags.....	24
Mackinaw coats, short.....	1,372
Mackinaw overcoats.....	34
Mackinaw trousers.....pairs..	1,372
Mittens, fur.....do..	1,100
Moccasins.....do..	607
Oilskin coats.....	191
Oilskin trousers.....pairs..	358
Parkas, denim.....	1,000
Shoes, horsehide.....pairs..	725
Shoe pacs.....	6
Southwester hats.....	396
Sweaters.....	173
Undershirts, wool, fleece-lined.....	5,096
Yukon stoves.....	5

CLOTHING PURCHASED FOR THE ARMY TRANSPORT SERVICE.

There were purchased during the past fiscal year from the appropriations for army transportation for the officers and crews of the United States army transport service the following clothing supplies, viz:

Aprons	2, 228
Cape, all kinds	868
Cap ornaments	870
Cap ribbons	3, 628
Chevrons	1, 191
Jackets and jumpers	6, 651
Hats	1, 980
Lanyards	800
Neckerchiefs	500
Overshirts	445
Pairs trousers, all kinds	4, 394

These articles were transferred to such of the crews of transports who were not able, for various reasons, to procure them in any other way. The cost of the property was either paid for in cash or collected from the pay of the persons to whom the same was transferred.

ISSUES TO THE ARMY.

There were issued to the Army the following quantities of the principal articles of clothing and equipage during the fiscal year ending June 30, 1901, viz:

TO TROOPS STATIONED IN, OR PRIOR TO THEIR DEPARTURE FROM, THE UNITED STATES.

Abdominal bands	66, 976	Overshoes, arctic	14, 215
Blankets, woolen	60, 029	Ponchos, rubber	40, 240
Blouses:		Shirts:	
Lined, made	54, 969	Chambray and gingham ...	47, 210
Unlined, made	3, 445	Dark-blue flannel	107, 274
Unmade	16, 847	Muslin	33, 865
Canvas fatigue coats	26, 945	Shoes:	
Canvas fatigue trousers, pairs ..	30, 720	Barrack	pairs.. 14, 944
Caps, forage	38, 638	Black	do... 103, 282
Caps, muskrat	8, 981	Russet	do... 56, 065
Collars, linen	96, 216	Stable frocks	11, 055
Drawers:		Stockings:	
Canton flannel	pairs.. 109, 920	Cotton	pairs.. 426, 765
Jeans	do... 65, 835	Woolen	do... 85, 367
Knit woolen	do... 18, 655	Summer coats	6, 710
Nankeen	do... 55, 554	Summer trousers	pairs.. 8, 329
Summer knit	do... 51, 816	Suspenders	do... 15, 594
Gauntlets:		Trousers:	
Buckskin	pairs.. 19, 496	Foot, made	58, 223
Muskrat	do... 9, 723	Foot, unmade	16, 296
Gloves, Berlin	do... 295, 440	Mounted, made	16, 992
Hats, campaign:		Mounted, unmade	5, 146
With large ventilators	29, 644	Undershirts:	
Without large ventilators ..	49, 069	Cotton	117, 984
Hat cords	75, 841	Nankeen	66, 686
Khaki coats	78, 673	Woolen	133, 544
Khaki trousers	pairs.. 92, 687	Waist belts, leather	34, 677
Leggings	do... 83, 656	Axes	3, 843
Overalls	do... 10, 141	Ax helves	10, 081
Overcoats, kersey, made	40, 575	Barrack bags	14, 405

TO TROOPS STATIONED IN, OR PRIOR TO THEIR DEPARTURE FROM, THE UNITED STATES—continued.

Bedsacks	21,803	Pickax helves.....	5,746
Bedsheets.....	22,592	Pillows.....	7,196
Bedsteads, iron, with woven wire bottoms	3,036	Pillow cases.....	16,328
Brooms, corn.....	27,286	Pillow sacks	3,026
Brushes, scrubbing	14,219	Shovels:	
Chairs, barrack.....	6,948	Long-handled.....	1,878
Hatchets.....	3,323	Short-handled.....	2,514
Hatchet helves.....	7,391	Spades.....	4,842
Kettles, camp.....	2,726	Tents:	
Mattresses.....	3,078	Common.....	1,257
Mattress covers.....	23,843	Conical wall.....	3,930
Mess pans.....	5,346	Hospital.....	665
Mosquito bars.....	20,734	Shelter halves.....	52,701
Mosquito head nets.....	18,185	Wall.....	1,992
Pickaxes.....	2,918	Trumpets.....	669

TO TROOPS STATIONED IN THE PHILIPPINES, CUBA, PORTO RICO, AND HAWAII.

Abdominal bands	23,654	Summer coats.....	12,854
Blankets, woolen.....	23,248	Summer trousers.....pairs..	12,541
Blouses, made and unmade	63,900	Suspenders.....do.....	25,942
Canvas fatigue coats.....	17,520	Trousers, kersey, made and unmade.....pairs..	72,213
Canvas fatigue trousers.....pairs..	29,996	Undershirts:	
Caps, forage.....	4,753	Cotton.....	130,780
Cap ornaments.....	280,102	Nankeen.....	99,706
Chevrons, all kinds.....pairs..	53,168	Woolen.....	77,763
Collars, linen.....	36,773	Waist belts, leather.....	58,443
Drawers:		Axes.....	6,333
Canton flannel.....pairs..	39,675	Ax helves.....	22,959
Cotton knit.....do.....	34,845	Barrack bags.....	12,473
Jeans.....do.....	151,957	Books, all kinds.....	6,377
Nankeen.....do.....	124,346	Brooms, corn.....	39,814
Gauntlets, buckskin.....do.....	16,172	Brushes, scrubbing	32,510
Gloves, Berlin.....	65,120	Chairs, barrack.....	6,524
Hats, campaign.....	167,023	Cots, camp.....	50,631
Hat cords.....	202,329	Flags, all kinds.....	7,392
Helmets, cork.....	24,059	Hatchets.....	933
Khaki coats.....	164,914	Hatchet helves.....	16,909
Khaki trousers.....pairs..	314,318	Kettles, camp.....	3,089
Leggings.....do.....	316,127	Mosquito bars.....	53,405
Overalls.....do.....	4,679	Pickaxes.....	2,815
Ponchos, rubber.....	42,604	Pickax helves.....	13,218
Shirts:		Shovels.....	6,982
Chambray.....	173,136	Tents:	
Dark blue.....	145,625	Common.....	2,008
Gingham.....	65,335	Conical wall.....	523
Muslin.....	13,936	Hospital.....	1,574
Shoes:		Shelter halves.....	12,956
Barrack.....pairs..	19,721	Wall.....	170
Black.....do.....	95,243	Tent pins, all kinds.....	95,612
Russet.....do.....	198,540	Tent poles, shelter.....	47,321
Stockings:		Trumpets.....	840
Cotton.....pairs..	878,136		
Woolen.....do.....	328,815		

CLOTHING AND EQUIPAGE SUPPLIES CONNECTED WITH THE SERVICE OF UNITED STATES TROOPS IN CHINA.

By reference to my annual report for the fiscal year ending June 30, 1900, the quantities of clothing and equirage supplies sent for issue to

the United States forces in China can be ascertained. No additional supplies were sent. A report has been received from the depot quartermaster at San Francisco, Cal., to the effect that the following were returned to this country, viz:

Wool blankets	2,789
Blouses, lined, made	12,271
Brassards	400
Canvas caps	7,258
Fur caps	1,439
Cloth chevrons	1,583
Drawers, canton flannel	889
Drawers, knit wool	150
Buckskin gauntlets	240
Fur gauntlets	7,541
Berlin gloves	1,663
Woolen gloves	21,573
Campaign hats	4
Hat cords	1,703
Overcoats	14,061
Arctic overshoes	14,020
Dark blue shirts	8,692
Black calfskin shoes	861
Wool stockings, heavy	15,940
German socks	2,646
Suspenders	194
Trouser stripes	123
Trousers	16,261
Wool undershirts, heavy	12,922
Waist belts	25
Bedsacks	5,858
Flag halliards	200
Mattress covers	144
Hospital tents and flies	2
Asbestos tent rings	600
Shoe laces	250
Buckles	1

Of the supplies shipped from Manila for use of the troops in China, the following are reported to have been returned to the San Francisco depot, viz: 1,508 blouses, unlined; 100 pairs trousers.

The clothing and equipage supplies not returned to the United States constitute those used by the United States forces in connection with the Chinese difficulties, though it is possible that some of the articles fit for use in the Philippines may have been sent to Manila with the returning troops.

ISSUES TO THE MILITIA.

Under the act of Congress approved June 6, 1900, amending section 1661, Revised Statutes, "making an annual appropriation to provide arms and equipments for the militia," the amount to be hereafter appropriated for the purpose indicated is \$1,000,000 instead of \$400,000 as heretofore.

There were issued under the provisions of said act, on requisitions duly approved by the Secretary of War, articles of clothing, equipage, and other quartermaster's stores, for which the respective appropriations for the Quartermaster's Department have been reimbursed, as follows:

States and Territories.	Clothing and equipage.	Regular supplies.	Army transportation.	Total.
Alabama.....	\$4,782.15			\$4,782.15
Arizona.....	407.59			407.59
Arkansas.....	1,605.06	\$75.00		1,681.06
California.....	10,438.24			10,438.24
Colorado.....	5,979.03			5,979.03
Connecticut.....	4,788.94			4,788.94
Delaware.....	3,045.44			3,045.44
District of Columbia.....	4,266.64	661.37	\$27.39	4,955.40
Florida.....	4,961.66			4,961.66
Georgia.....	8,888.16	77.28		8,965.44
Idaho.....	1,587.05			1,587.05
Illinois.....	299.00			299.00
Indiana.....	6,621.27			6,621.27
Iowa.....	1,920.12			1,920.12
Kansas.....	4,701.62			4,701.62
Kentucky.....	24,206.54			24,206.54
Louisiana.....	8,144.14			8,144.14
Maine.....	3,756.10			3,756.10
Maryland.....	4,737.69	653.32		5,391.01
Massachusetts.....	4,936.79			4,936.79
Michigan.....	16,568.92			16,568.92
Minnesota.....	3,088.92		198.00	3,286.92
Mississippi.....	4,332.07			4,332.07
Missouri.....	16,421.55	1,485.00		17,906.55
Montana.....				
Nebraska.....	9,823.46		13.00	9,836.46
Nevada.....				
New Hampshire.....	2,657.93			2,657.93
New Jersey.....	256.43			256.43
New Mexico.....	2,739.98	18.00		2,757.98
New York.....	1,828.06			1,828.06
North Carolina.....	16,706.22			16,706.22
North Dakota.....	4,122.80			4,122.80
Ohio.....	19,807.05	1,196.54	87.66	21,091.25
Oklahoma.....	3,179.32			3,179.32
Oregon.....	2,875.50			2,875.50
Pennsylvania.....	544.80			544.80
South Carolina.....	8,970.91			8,970.91
Tennessee.....	16,382.15			16,382.15
Texas.....	22,004.56	1,060.08		23,064.64
Utah.....	4,071.96	92.85		4,164.81
Vermont.....	6,380.38		6.19	6,386.57
Virginia.....	14,216.09			14,216.09
Washington.....	2,551.09			2,551.09
West Virginia.....	9,244.56			9,244.56
Wisconsin.....	16,188.45			16,188.45
Wyoming.....	169.44	242.20		411.64
Deduct credit placed to allotment of State of Kansas.....	315,205.85	5,562.64	332.24	321,100.73
Deduct credit placed to allotment of State of Utah.....	138.50			
	65.23			
Total.....	315,002.12	5,562.64	332.24	320,897.00

In addition to the above, issues of clothing and other equipments to the money value of \$1,772.10 were made by the Navy Department to the naval battalion of the District of Columbia (now part of the National Guard, under the provisions of the act of Congress approved May 11, 1898), and proper credits given therefor by transfer of appropriations upon the books of the Treasury Department.

There were also issued to the commanding general, District of Columbia militia, during the fiscal year ended June 30, 1901, under the act of Congress approved March 1, 1889, and for which this Department will not be reimbursed, the following quartermaster's supplies, viz:

Clothing and equipage.....	\$2,354.36
Regular supplies.....	626.97
Total.....	2,981.33

SALES TO THE MILITIA.

Under the act of Congress approved February 24, 1897, the Department is authorized to sell to the governors of the States and Territories

such supplies as the Secretary of War may authorize, provided the same can be spared. Under this authority there were sold during the past fiscal year, at the regulation prices for cash, clothing and equipage supplies to the following amounts:

State.	Clothing and equipage.	Packing charges.	Total.
California	\$2,515.60	\$38.84	\$2,554.44
Georgia	136.44	1.68	138.12
Pennsylvania	4,047.00	29.21	4,076.21
Wisconsin	415.00	5.06	419.06
Total			7,187.83

Under the act of Congress approved March 15, 1898, the cost of all stores and supplies sold to any State or Territory is credited to the appropriation from which procured, thereby enabling the Department to replace the supplies.

SETTLEMENT OF CLAIMS OF STATES AND TERRITORIES BY RETURNING STORES IN KIND IN COMPENSATION FOR QUARTERMASTER'S SUPPLIES BROUGHT INTO THE UNITED STATES SERVICE BY VOLUNTEERS DURING THE WAR WITH SPAIN.

The act of Congress approved May 26, 1900, making appropriation for the support of the Regular and Volunteer Army for the fiscal year 1900-1901, contains a provision for the replacement of such quartermaster's supplies as were furnished by the States and brought into the service of the United States by volunteer troops during the recent war with Spain, exclusive of such claims as have been allowed by the Auditor for the War Department and such allowance accepted by the States.

As a preliminary, this office, on the 18th of June, 1900, recommended to the Secretary of War that the opinion of the Judge-Advocate-General upon this matter be obtained, which was done. Said opinion, as approved by the Secretary of War, is as follows:

1. That the act applies not only to stores brought into the United States' service by volunteers from supplies furnished the States or Territories under the annual militia appropriation, but also supplies purchased by the States and Territories for which no claim has been allowed and accepted.
2. The act authorizes the property to be replaced, article for article, irrespective of its condition at the time it was accepted into the service of the United States.
3. The act does not require the article to be strictly new, but that issues can be made of tentage which has been used somewhat, but is still in a perfectly serviceable condition.

The following is a complete statement showing the claims that have been allowed by this Department up to June 30, 1901. Property to the value of \$293,417.33 has been turned over to the governors of the respective States and Territories in settlement, viz:

Alabama	\$10,716.89
California	2,191.00
District of Columbia	7,939.94
Georgia	6,581.96
Illinois	8,943.64
Indiana	54,652.37
Iowa	21,086.81

Kansas	\$26,442.73
Louisiana	2,243.76
Maryland	7,588.72
Minnesota	12,628.66
Nebraska	16,041.95
North Dakota	1,701.10
Ohio	17,756.14
South Carolina	2,052.37
South Dakota	9,025.38
Texas	23,039.45
Utah	5,616.08
Virginia	25,637.62
Washington	20,877.88
Wisconsin	3,292.72
Wyoming	7,360.16
Total	293,417.33

The States of Indiana, Virginia, and Washington, not having facilities for storage of the clothing and other quartermaster's property allowed by the Secretary of War under this act, have been permitted to draw the same from time to time as needed.

The mode of settlement as pointed out in my last annual report, to prevent any possible errors in adjudication, has been adhered to. Every item has been verified by reference to the Auditor for the War Department, as well as by comparison with the property returns on file in this office.

CLOTHING FOR DISCHARGED PRISONERS.

Under the act of Congress approved March 16, 1896, each prisoner under sentence of a court-martial, upon his release from confinement, is entitled to a suit of outer clothing at a cost of not to exceed \$10 per suit. Remittances for this particular purpose, amounting to \$17,094, were made to various officers during the past fiscal year.

ISSUES TO INDIAN PRISONERS OF WAR.

No issues of clothing and equipage were made during the last fiscal year to the Indian prisoners of war held at Fort Sill, Okla., it being the intention to make these Indians self-supporting.

SALES.

Under special authority of the Secretary of War, there were sold during the past fiscal year to various branches of the Government service, at the regulation prices for cash, clothing and equipage as follows, viz:

Ordnance Department, U. S. A.	\$1,660.00
Engineer Department, U. S. A.	32.64
Record and Pension Office	1.96
United States Marine-Hospital Service	1,254.88
Interior Department	3.92
Navy Department	1,716.33
United States Marine Corps	5,315.91
Geological Survey	2,252.62
Agricultural Department	490.03
United States Soldiers' Home	272.18
Chickamauga and Chattanooga National Park Commission	12.32
Gettysburg National Park Commission	20.66
Superintendent State, War, and Navy Department building	37.40

SALES OF CONDEMNED CLOTHING AND EQUIPAGE.

From reports received it is ascertained that the sum of \$31,808.92 was realized from sales at auction during the last fiscal year at the general depots of the Quartermaster's Department of condemned articles of clothing and equipage supplies.

This amount, less the expenses of the sales (\$630.04), has been covered into the Treasury of the United States and credited to miscellaneous receipts.

REORGANIZATION OF THE SYSTEM OF INSPECTING CLOTHING AND EQUIPAGE SUPPLIES.

Much time and attention has been given to the inspection of the clothing and equipage supplies procured at the purchasing and manufacturing depots of the Quartermaster's Department. These inspections have been most thorough and it is believed that the articles accepted have been fully up to specification requirements.

Under the system heretofore prevailing the inspection of supplies at depots, without the special supervision of this office, was final. With the establishment of the purchasing depots in the cities of Boston, New York, and Chicago, in addition to those at Philadelphia, Jeffersonville, and San Francisco, where the principal purchases were made prior to the Spanish-American war, the necessity of reorganizing the entire system of inspection soon made itself manifest.

The first steps to bring this about were taken, and as far as this office is able to judge, after the lapse of a comparatively short time, the results thus far attained prove conclusively that the interests of the service will best be served by a continuation of the plan conceived which is simply that of exercising a direct supervisory control here over the inspections at all the depots, thereby securing absolute uniformity.

Permit me to call attention to that part of my last annual report which has reference to this subject. The views then entertained have, in the main, been adhered to and carried out.

By authority of the Secretary of War, two inspectors, thoroughly competent in their respective branches, have been employed for duty in this office. To one of these inspectors all matters pertaining to the technical character of textile fabrics are referred, and to the other all questions pertaining to the quality of shoes.

The next step taken was to furnish to each of the depots the necessary corps of inspectors, all of whom were appointed under the civil-service rules. In the examination of applicants for these positions the questions formulated were of such a character as to fully demonstrate their fitness, which has since been proven.

In the matter of shoes, the following system of inspection is now observed at all the depots: Inspectors are placed in the factories making shoes under contract. All the material entering into the shoes is carefully examined, and such as may be found unfit is thrown out. The soles and heel lifts are stamped with the name of the inspector before completion of the shoes, prior to their being sent to the depot for final inspection. If satisfactory, the name of the inspector is then placed upon the shank of the shoe, together with name of the depot accepting the same. In case of rejection a private stamp is placed upon a certain part of the shoe, known only to the contractors and the contracting officers. The Department is thus protected from

any attempt to again offer shoes after the same shall have been once rejected. Furthermore, the officers in charge of depots are required to forward to this office weekly samples of shoes accepted during the previous week under each particular contract. These shoes are carefully examined by the shoe inspector here, who, if necessary, dissects them and any defect in material or workmanship discovered is made known to the contracting officer.

As a result there is no question but that the shoes now being purchased are the best that can be furnished.

The shoe inspector of this office is also ordered, at irregular intervals, to inspect the various factories of the contractors, and whatever irregularities may be found to exist are brought to the attention of the purchasing officer and also of this Department.

Gauges for measuring the thickness of leather have been specially manufactured and distributed to the purchasing depots for the use of inspectors. They are stamped "U. S. Q. M. Dept. Standard." All possible misunderstandings will thus be prevented and the desired uniformity secured.

Regarding the inspection of textile fabrics, standing instructions have been given to each of the purchasing depots to forward to this office representative samples of accepted deliveries of each and every article. Upon receipt they are critically examined by the expert of this office. Wherever any of these articles differ either in quality or make from the established standards and specifications attention is called thereto. This also has resulted in improving the quality of the goods procured under contract and securing absolute uniformity at all the depots.

There is no question but that with a full cooperation on the part of the officers in charge of depots the standard of supplies hereafter to be procured will be much higher than ever in the history of the Department. Under these conditions the services of the shoe and textile inspectors of this office are an absolute necessity, for upon them depends the solution of the various technical questions which arise from time to time.

This office is also now enabled to satisfactorily settle all differences of opinion between contractors and the inspecting officers at depots upon technical points, by sending the textile inspector to the factories to examine into and adjust matters. This feature in the new inspection system has met with much favor on the part of the contractors, as tending to avoid any unnecessary controversies.

STANDARDS AND SPECIFICATIONS.

All the existing specifications for clothing and materials are now being examined into, and any inaccuracies discovered will be corrected. The same action is also taken in regard to the standard samples. Wherever it is found that the standards and specifications are not in accord they are to be made to conform.

IMPROVEMENTS AND CHANGES IN UNIFORM.

CAMPAIGN HATS.

Of the several kinds of head gear issued to the enlisted men of the Army none appears to give better satisfaction than the campaign hats. Heretofore, in those intended for the troops in the Philippines a cor-

rugated insertion of leather underneath the sweat band was provided, so as to give a better ventilation. It has been ascertained that this corrugation does not retain its stiffness. This office therefore took up the subject and caused the purchase of 1,000 each of hats with corrugated aluminum and celluloid insertions.

Of these, 800 each were sent to Manila and 150 each to Cuba for trial in active service. Reports from Cuba have already been received which indicate that the proposed change in ventilation meets with universal favor, preference being given to the celluloid corrugations.

NAINSOOK UNDERWEAR.

Ever since the outbreak of the Spanish-American war this office has endeavored to provide underwear that shall be suitable to the climate of our new tropical possessions in which the troops are serving. With a view to ascertaining the particular kind of underwear that should be furnished, this Department has been supplying light cotton undershirts, jean drawers, nankeen as well as nainsook undershirts and drawers.

The latter were considered the most suitable, and 3,000 of each shirts and drawers were procured and sent to the Philippine Islands for trial and report.

Reports have been received from which it appears that the nainsook undershirts give the best satisfaction, but a few officers believe that the jean drawers are stronger. This criticism, however, was anticipated by this office, steps having already been taken to manufacture samples with reinforce pieces. Thus strengthened it is thought the drawers made of nainsook will prove equally as serviceable as those made of jeans. As far as can now be judged the question of underwear is still in an experimental stage.

TROPICAL CLOTHING.

On the 17th of January last a communication was received at this office, bearing an indorsement of the commanding general, Department of Northern Luzon, dated December 4 last, with reference to certain proposed changes in the uniform of the troops stationed in the Philippine Islands. The officer referred to remarks:

The uniform now furnished is believed by the Department commander to be as near suitable for service in the tropics as any that can be devised. Marching with or without clothing with the mercury at 100 in the shade is uncomfortable, and no uniform can be made that will enable troops to march without exhaustion and fatigue in such a temperature. The less experience officers have the more readiness they assume to make suggestions. It is probable that long service of our troops in the Philippines may result in experience that will justify slight changes in the uniform now issued for service here.

The above views, which were approved by the commanding general, Division of the Philippines, speak for themselves.

I further quote from the annual report of Maj. C. P. Miller, quartermaster, U. S. A., chief quartermaster Division of the Philippines, for the fiscal year ending June 30, 1901, as follows:

The quality of the clothing furnished during the past year has been excellent. Only a few complaints have been made, and those concerning the quality of khaki from America, which, although it will stand washing, as a rule fades from perspiration. Considerable difficulty has been experienced regarding the sizes of clothing. The schedule in use in the United States can not be followed in the Philippines. The average American soldier after having served here for any length of time loses

considerably in waist and chest measurement, with the result that the small sizes are called for in much larger proportions than in the United States.

The new woolen blanket, of about half the weight of the regular blanket, is destined to be very popular with the troops, judging from the reports already received.

The shoes are excellent, and give general satisfaction. There are always complaints regarding footwear, but these complaints are fewer in the Philippine Islands than in the United States.

The annual report of the chief quartermaster Department of Cuba for the last fiscal year shows that the clothing supplied to the troops serving in Cuba is equally as satisfactory.

From a report recently received from the depot quartermaster at Honolulu, H. I., it appears that no demand for heavy blue clothing, either dress or undress, exists and none is required at that particular station. He states, however, that khaki and white uniforms, together with the lightest-weight underclothing, sleeveless undershirts, and light-weight socks are best adapted to service in the Hawaiian Islands.

ARCTIC CLOTHING.

When existing conditions required the occupation of Alaska by United States troops, this Department was confronted with a new problem as to the particular clothing needed to comfortably protect the men in garrison, or on the trail engaged in telegraph-line construction, from the rigors of that trying climate. The fur and other heavy clothing furnished troops at our most northern posts in the States being manifestly inadequate for the purpose, a supply list of extra-heavy clothing was made up to meet this contingency.

The cost of this extra supply of clothing per man was about \$30, and upon recommendation of this office the Secretary of War authorized the above sum to be added to the already established allowance of each of the enlisted men serving in the Department of Alaska. Experience has demonstrated that the clothing furnished in the first instance was most liberal and that the variety could be somewhat reduced without detriment to the health and comfort of the troops.

Based upon personal experience and reports from officers who had served at least one winter in Alaska, the chief quartermaster of the Department recently made recommendation that Mackinaw overcoats, shoe and boot pacs, felt boots, wildcat caps and sweaters be eliminated from future issues. Mackinaw clothing not having proven entirely satisfactory, especially in severe weather, a double-breasted canvas blanket-lined pea-jacket, blue in color, with trousers of the same canvas but having a lighter-weight blanket lining has been devised as more fully meeting the requirements of the country, and will, it is believed, eventually supersede all the Mackinaw garments.

A muskrat cap of improved pattern forms part of the clothing shipped this year to Alaska. The ear flaps in front are extended to cover the cheek bones, a small detachable fur strap serves to protect the bridge and end of the nose from freezing, while the lower corners of the flap lap over and fasten by means of a snap fastener, so as to cover the chin. For field or trail purposes a garment called a parka, made of blue denim, having a hood trimmed with wolfskin and a lining at



Improved fur cap,
front.

the cuff of same kind of fur, has been specially manufactured and furnished to meet an existing need not filled by the outer garments heretofore supplied. Illustrations of the improved fur cap and of the parka referred to accompany this report.

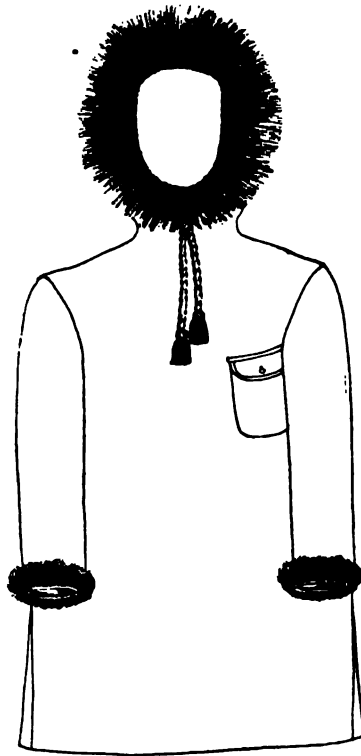


Improved fur cap, side view, and parka with fur cuffs and fur hood thrown back.

The muskrat mittens hereafter to be furnished to troops in Alaska will have the lining sewed in only at the cuffs, so as to enable the wearer to pull it out and dry it when damp from perspiration, which frequently happens. The regulation heavy woolen underwear worn by troops in the States being found from experience to be of too light a weight for proper protection, heavy fleece-lined garments have been specially procured to afford a greater amount of warmth and better meet the requirements of the service during the severest portion of the year.

The distance from source of supply, scarcity of transportation facilities, and shortness of the working season, renders the supplying of troops in Alaska, especially at posts on the Upper Yukon River, with clothing, a matter of considerable difficulty. The loss or breakdown of a ship carrying supplies might mean much suffering among the troops during the succeeding winter. To guard against such contin-

gencies posts are expected to keep at least one year's clothing supplies ahead of requirements, and, in addition, the Department has established a reserve depot at Fort St. Michaels, well stocked with all articles of clothing, equipage, and materials essential to the climate, which



Front view of parka hood in use.

can be drawn upon at any time much more expeditiously than by requisition to the United States. By these means it is believed the troops stationed in Alaska have been, and will continue to be, adequately furnished with necessary clothing supplies.

KHAKI CLOTHING.

The khaki clothing manufactured for issue to troops is, taking all the circumstances into consideration, as near perfect as it is possible to produce.

The difficulties of the Department in securing a material, the color of which shall be proof against the effects of both sun, perspiration, and washing, have, it is believed, been almost overcome. A new standard khaki material has been adopted which is considered the best that the Department has thus far been able to secure.

Owing to the great demand for khaki clothing for the troops serving in the Philippine Islands and Cuba, this Department has not been able to supply any of this clothing to the militia of the States, and only in a few cases have the troops stationed at extreme southern posts in the United States been furnished with the same. The latter, under existing regulations, are entitled to draw white bleached duck clothing. Of this the Department has quite a large supply on hand. The accumulation is due to the fact that at the outbreak of the Spanish-American war, when the Volunteer Army was brought into existence, the Department made provision for a reasonable supply to meet any demand likely to arise. The close of the war and the disbandment of the large volunteer army left the Department in possession of this large supply of white summer clothing, which, in the interest of economy, should, as far as practicable, be issued to the Army in the States before making the khaki clothing an item of general issue.

KHAKI SHIRTS.

A number of khaki-dyed cotton shirts were sent to Manila for trial by troops, and reports received indicate that the color is not perspiration proof. This is especially noticeable wherever the material came in direct contact with the body of the wearer. Upon washing the shirts it was found that the material showed large white streaks and spots. It has therefore been decided to make no further purchases of khaki cotton shirting. Experiments are still being prosecuted, but an early solution of this most difficult question is not expected.

Several firms have shown quite an interest in the development of a khaki dye for woolen fabrics, but, with one exception, nothing satisfactory has thus far been accomplished. While most of the samples submitted stood the soap and soda tests comparatively well, yet, upon subjecting them to the perspiration tests, a marked discoloration was observed.

One firm, after repeated experiments, finally succeeded in producing a sample which examination and chemical tests proved to be worthy of a trial. As a consequence sufficient material to manufacture 500 shirts has been purchased. The shirts are now being made up at the New York depot and so soon as they are ready they will be sent to the Philippines for trial by troops. It is to be hoped that said trial may be successful.

In the meantime the Department will continue the issue of the dark blue flannel and chambray shirts, the strength and quality of which have been greatly improved.

VISIBILITY OF KHAKI COLOR AT A DISTANCE.

In order to ascertain, if possible, the military advantages of khaki-colored clothing when worn by troops at a distance, as compared with dark blue, a number of khaki-colored cotton shirts were sent to the post of Fort Myer, Va., for experimental trial.

Reports have been received, but the results are not conclusive, inasmuch as the nature of the perspective, condition of the atmosphere, and elevation of the sun above the horizon largely enter into the subject.

Upon presentation of the foregoing views to the Secretary of War, the recommendation of this office that shirts of both colors be furnished

the Army, to meet the varying conditions and environment existing, was approved.

Of course this depends upon whether the repeated efforts of this Department to produce a satisfactory khaki shirt for active field operations in the tropics shall meet with success.

RIDING BREECHES.

The 587 pairs of riding breeches made of khaki material, referred to in my last annual report, were sent on September 12, 1900, to Matanzas, Cuba, and issued for trial to several troops of the Second Cavalry stationed there.

Reports have been received that these trousers have given general satisfaction and that they are superior to the mounted khaki trousers now supplied by this Department. A suggestion is made, however, that they be given a little more fullness in the seat and thighs and cut so as to allow the fullest flexion of the knee without binding or bringing too much strain on that point.

Upon receipt of this report the depot quartermaster at New York was directed to cause the manufacture of a few pairs of trousers conforming to the suggestions referred to. They have been adopted. A requisition for an additional 3,200 pairs of riding breeches has been received and they will be made to conform to the modified patterns.

LEGGINGS.

The attention of this Department having been called to the advisability of providing the leggings issued to the enlisted men with lacing studs having larger heads, thereby preventing the lacings from becoming detached, this office, after careful inquiry, decided to give them a service trial. Consequently, 5,000 pairs of leggings provided with these larger studs have been procured after public competition. They are now being distributed, and reports upon the merits of same have been called for.

BLANKETS, LIGHT WEIGHT, FOR TROPICAL SERVICE.

The matter of providing the army serving in tropical countries with woolen blankets of a lighter weight having been brought to the attention of this office, a few blankets which it was thought would prove acceptable were manufactured and sent to Manila. Official advices from the chief quartermaster, Division of the Philippines, are to the effect that they are entirely satisfactory.

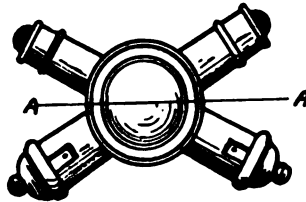
This office, therefore, prepared specifications for a blanket with cotton warp, wool to be made of high one-half blood wool, and to weigh 3 pounds each. Standards conforming to these specifications were then procured and distributed to the general purchasing depots. Proposals for furnishing 20,000 of these blankets, subject to 20 per cent increase in quantity, were invited and contract awarded. Ten thousand will be shipped to Manila at an early date.

INSIGNIA FOR THE ARTILLERY CORPS.

The act of Congress to increase the efficiency of the permanent military establishment of the United States, approved February 2, 1901, under which the artillery arm of the service was divided into

coast and field artillery, necessitated a modification in the insignia for the officers and enlisted men of said corps.

After due consideration it has been decided, and announcement made in General Orders, No. 98, Headquarters of the Army, 1901, that the insignia for the undress coat and shoulder knots of officers shall consist of two crossed cannon of the former design, of gold or gilt metal or embroidered in gold, with an oval at intersection having a plain scarlet center, thus:

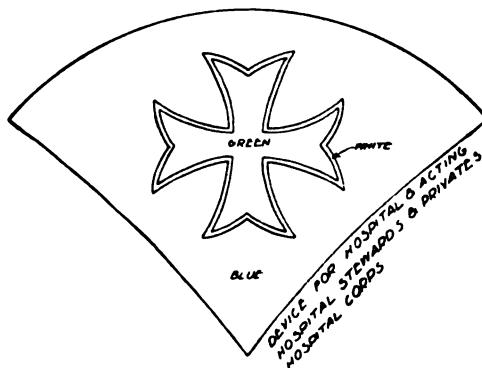


SECTION A.A.

In the case of the cap ornaments for the enlisted men of the Artillery Corps the old badge is to be retained, except that the number of battery is to be worn in the lower angle.

CHANGES IN INSIGNIA FOR CHEVRONS AND CAP ORNAMENTS.

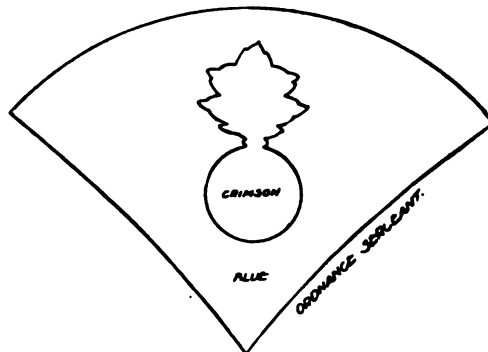
The chevrons and cap ornaments for the enlisted men of the Hospital Corps heretofore consisted of a Geneva cross. General Orders, No. 19, Headquarters of the Army, current series, provides that the insignia for the chevrons shall be a modified Maltese cross 2 inches wide and 2 inches high, of green cloth having a white border.



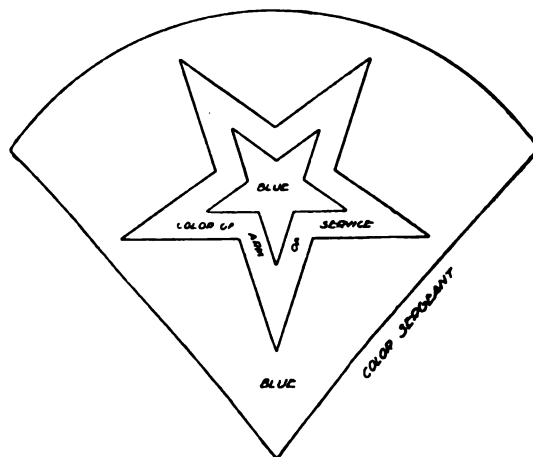
The white brassard bearing a red cross, prescribed for privates of the Hospital Corps and all persons neutralized by the terms of the Geneva convention, will hereafter be worn only in time of war with a signatory power of said convention.

The cap ornaments heretofore worn by the ordnance sergeants consisted of a shell and flame, while the insignia for their chevrons was a

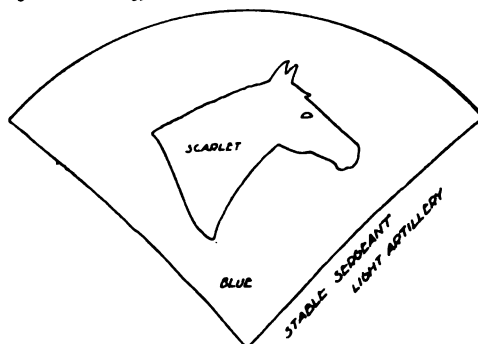
five-pointed star. This incongruity has been modified by substituting for the star the shell and flame.



The rank of color sergeants was formerly indicated upon their chevrons by a sphere, which never met with favor. It was decided to substitute the five-pointed star, heretofore worn by the ordnance sergeants.



With the creation of the rank of stable sergeants for field artillery it became necessary to adopt chevrons for these noncommissioned officers. This was done by selecting the head of a horse as most appropriate.



All the changes referred to have been announced to the Army in general orders.

CHEVRONS OF SMALLER SIZE.

For a number of years this office has been of opinion that the size of the chevrons issued to the noncommissioned officers of the Army was unnecessarily large. This was especially made manifest by the adoption of the small-size chevrons for dark blue shirts.

The subject was laid before the equipment board of this office, which, after due consideration, suggested reference to the Secretary of War with recommendation for adoption. Before doing so, however, it was deemed best to obtain the views of the various department commanders. It was pointed out that in the opinion of this office the smaller chevrons offer a less conspicuous target to the enemy and present equally as good an appearance as those of the present pattern.

The replies received being all in favor of the smaller chevrons, recommendation was made to the Secretary of War that the same be adopted for all garments, except dress coats, upon which chevrons of gold lace are worn.

This recommendation having met with approval, instructions were given to discontinue the manufacture of the larger chevrons. The issue of those now on hand will be continued until exhausted. Not until this shall have been accomplished will the manufacture and issue of the small-size chevrons be commenced. In the meantime standard samples and specifications will be perfected.

In this connection it is thought that the question of abolishing the gold-lace chevrons and providing the dress coats also with small-size cloth chevrons should be carefully considered. The gold-lace chevrons are apt to tarnish and soon lose their brilliancy. It is only with the utmost care that the small supply which must be held in depot ready for issue is kept from disintegration. The cloth chevrons always preserve their freshness and appearance, and should these views be ultimately concurred in by higher authority, the question of supply of the various kinds heretofore in use will be greatly simplified.

RAIN GARMENTS.

The contractors for furnishing this Department with khaki material submitted to this office several samples of experimental clothing intended to protect the enlisted men serving in the Tropics from rain. These samples consisted of slickers, and overcoats with cape, made of khaki material of suitable weight, and ponchos, box coats, and overcoats with cape, made of the heavier regulation material and the lighter khaki shirting, between which two materials there had been placed a coating of rubber.

All these garments have been sent to the depot quartermaster at Manila for trial by troops in active service, and the chief quartermaster of the Division of the Philippines requested to obtain and forward reports upon the adaptability of the garments for the purpose for which intended.

Another firm submitted to this office samples of a waterproof overcoat and cape of the color of the regulation sky-blue kersey, intended to take the place of the kersey overcoat and dispensing with the use of the poncho. Being favorably impressed by several tests of the mate-

rial made in this office, the depot quartermaster at New York has been directed to procure 500 of these coats for trial in active service, at a cost of \$6.75 per coat.

PONCHOS.

A requisition for 150,000 rubber ponchos of extra large size (90 by 66 inches), with glove fasteners and also with grommets, was made upon this office by the depot quartermaster at Manila. Specifications were prepared and advertisements published inviting bids. The specifications required the use of pure Para rubber. Contracts were awarded to several of the lowest responsible bidders in order to secure early deliveries.

The process of manufacturing rubber goods has always been regarded as a secret and carefully guarded by the manufacturers. As a consequence this Department in making awards for such a large quantity of ponchos felt compelled to guard against the furnishing of any goods but such as would give good service. The percentage of the materials to be used was therefore fixed by this Department. Several of the successful bidders have up to this time failed absolutely to furnish a product which, in the opinion of experts, would be desirable. The contracts have since expired. No purchases to cover the number of ponchos in default will be made, as the military conditions and requirements in the Philippines have considerably changed since the contracts were awarded. One firm, however, to which part of the contracts was given is complying with requirements and the Department is purchasing from this firm 60,000 ponchos under the terms of the contract.

This has led to further action on the part of this office, and specifications for all kinds of rubber articles, such as ponchos, arctic overshoes and boots, are now in process of preparation. This Department will hereafter insist that the material entering into these articles shall consist of 37½ per cent of best "up river" pure Para rubber, 12½ per cent of best "Caucho" rubber, 25 per cent of litharge for a proper vulcanization, and the remainder of such compounding materials as will produce the desired product. Under no circumstances will the employment of any reclaimed rubber or rubber substitutes be permitted.

Pending the investigation of this difficult subject, a manufacturer of waterproof oilskin clothing experimented with and submitted to this office samples of a black oilskin poncho of same material as that used in the manufacture of slickers for fishermen.

To ascertain the merits of such ponchos, as compared with rubber, steps have been taken to purchase 1,000. When completed it is the intention to send them to the Philippines for comparative trial by troops.

SLICKERS.

In addition to the ponchos called for, a requisition has just been received at this office from the depot quartermaster at Manila for 10,000 yellow oilskin slickers for use of the mounted troops on duty in the various parts of the Philippine Islands. Samples of a suitable quality have been obtained and distributed to several of the purchas-

ing depots of the Quartermaster's Department, and proposals for furnishing the same are now being invited.

CHROME-TANNED SHOES.

The attention of this Department having been called to the great advancement that had taken place in the tannage of calfskins within the last few years, and especially to the great superiority of black chrome-tanned wax calfskin upper leather over the oak-tanned leather heretofore used exclusively in the manufacture of army shoes, steps were immediately taken to ascertain the facts in the matter.

The opinions of experts were invited as to the weight of the skins which should be used, resulting in the abandonment of the system formerly prevailing, viz: To require a certain weight per skin, and substituting therefor a restriction requiring the skins to be of 15 feet maximum measurement, same as in the russet shoes.

During the consideration of this subject the following facts were developed, viz:

1. Chrome-tanned upper leather has a smoother finish than oak tanned.

2. It is not as apt to "rough up" as the oak-tanned skin.

3. It is more pliable and possesses greater waterproofing qualities.

4. After being wet and dried it is not apt to grow hard and crack.

5. A large percentage of the best shoe manufacturers of the country are now using chrome-tanned calfskins, and all speak highly of its value.

Having thus become convinced that the chrome-tanned upper leather would give equally as good, if not superior, service, a decision was reached to purchase 25,000 pairs of shoes for test in service.

RUSSET SHOES.

Complaints having reached this office from Cuba that the russet shoes supplied to the Army are not satisfactory samples were obtained and careful investigation demonstrated that the shoes did not receive that care which should have been given. No dressing to preserve them appears to have been used. The very fact of the russet upper leather being tanned on the grain necessitates greater care, being liable to scrape or peel upon coming in contact with hard substances. It is believed that the best leather possible is being secured for army shoes, although occasionally some inferior stock will get into the vamps notwithstanding the utmost care that is being exercised by the inspectors.

It should be stated that at the time the russet shoes were adopted the only successful process of finishing this class of leather was on the grain surface. It has been learned that within the last six months the process of finishing russet leather on the flesh side has, it is claimed, been perfected. This matter will receive the most careful and exhaustive consideration whenever future purchases are to be made.

BAND INSTRUMENTS.

Upon the increase of the authorized strength of army bands from 24 to 28 musicians it was found to be advisable to provide for a some-

what wider range in the prescribed instrumentation. The regulations have therefore been amended so as to permit the issue of flugel horns, euphoniums, alto and baritone saxophones, which have undoubtedly improved the quality and variety of tone produced by army bands.

As the volunteer organizations were mustered out of the United States service from time to time the instruments in possession of the respective bands have been collected and shipped to the depot at Philadelphia, Pa., and there, when deemed worth the cost of necessary repairs by the corps of musical experts in the employ of this Department, have been returned to the respective manufacturers, carefully overhauled, and placed in a thoroughly serviceable condition for further use. These instruments, which are of the highest grade and best make, have been reissued to a considerable extent in outfitting the newly organized bands of the Regular Army, and the remainder will be held and applied from time to time upon requisitions from the Army until exhausted.

In the interests of economy it has been necessary to suspend temporarily the practice of the past few years permitting the respective bands to indicate the particular make of instruments deemed most suitable to the requirements of the individual musicians, provided those of domestic production are selected, and for the present requisitions will be filled from available stock, irrespective of the make of instruments desired.

LOAN OF FLAGS FOR INAUGURATION CEREMONIES.

There were loaned in March last to the executive committee on inaugural ceremonies, under joint resolution of Congress approved January 22 last, 100 garrison, 500 post, and 1,000 storm and recruiting flags, for decorative purposes, all of which were new.

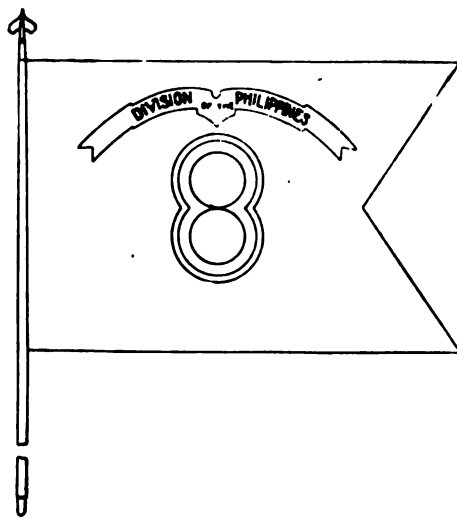
COLORS FOR NATIVE CHIEFS IN THE PHILIPPINES.

At the request of Brig. Gen. W. A. Kobbe, U. S. V., commanding Department of Mindanao and Jolo, P. I., 6 silken national colors with staffs were procured by this Department and shipped to the Philippine Islands for presentation to prominent native chiefs deserving recognition for their loyalty and friendship. General Kobbe, under date of June 17 last, in acknowledging the receipt of said flags, advises this office that the same were provided with silver plates suitably inscribed and presented with suitable formalities, and that they are held in great honor by the recipients, who take much pride in displaying them when occasion offers.

HEADQUARTERS FLAG FOR THE MILITARY DIVISION OF THE PHILIPPINES.

At the request of the commanding-general, Division of the Philippines, this Department has manufactured and furnished for the use of the headquarters of said division, a silken headquarters flag, a description of which was published in General Orders, No. 31, Headquarters

of the Army, current series. Being of an historical interest, I herewith submit an illustration of the flag referred to.



Headquarters flag for the Division of the Philippines. Scale: 1 inch, 1 foot.

KHAKI-COLORED TENTS.

On the 8th of January, 1900, a Khaki-colored wall tent was erected adjacent to the War Department building, with a view to ascertaining its general qualities. The tent stands to-day. It has been exposed during a period of nineteen months to all kinds of weather, and the results of the trial have certainly been very satisfactory. The fly has somewhat faded and undergone a change, probably due to the soot from surrounding chimneys and the dust of the streets. The underside of the fly, as well as the tent itself, still retains its color. But what is most remarkable is the absolute absence of mildew. Any white tent would long ere this have been rendered valueless.

It has been decided to adhere to the decision heretofore made to purchase only Khaki-colored duck for the manufacture of tents in the future.

TENTS FOR GALVESTON FLOOD SUFFERERS.

Under authority of the Secretary of War there were sent to the mayor of Galveston, Tex., from the depot at St. Louis, Mo., in charge of an agent, to secure prompt delivery, 878 tents of miscellaneous character for use of the sufferers from the great tidal wave and storm which devastated the city of Galveston in September last. They were shipped in the afternoon of September 11, 1900, by passenger train.

There were also shipped to Galveston from Fort Sam Houston, Tex., for the same object, as an emergency, 323 tents of various sizes; which action, upon the recommendation of this office, was approved by the Secretary of War.

None of the tentage has been returned to the custody of this Department.

TENTS FOR SUFFERERS FROM FIRE AT JACKSONVILLE, FLA.

Upon the urgent call of the governor of the State of Florida and other citizens of the city of Jacksonville, the Secretary of War authorized the loan of 1,000 worn but serviceable hospital tents to the mayor of Jacksonville for the shelter of the people who, on account of the great conflagration, were rendered homeless, with the understanding that the same were to be returned to St. Asaph without expense to the United States in same condition as when received, fair wear and tear excepted.

The depot quartermaster at St. Asaph was directed to personally accompany the tents, to insure prompt arrival and delivery. The tents left the depot at 4 o'clock a. m., May 4, and arrived at Jacksonville at 10 o'clock a. m. on the day following.

Of those sent, 775 tents, 848 tent flies with poles, and 25,000 pins have thus far been returned to the St. Asaph depot without cost to the Department. It is stated that this property is in very good condition—in fact, better than could have been expected under the circumstances.

TENTS FOR FLOOD SUFFERERS AT ELIZABETHTON, TENN.

By the authority of the Secretary of War there was sent on May 24 last, from the depot at St. Asaph, Va, by passenger train, to the clerk of the chancery court at Elizabethton, Tenn., for the shelter of flood sufferers, 50 complete hospital tents. Of these, 34 have thus far been returned, and it is stated that the remaining 16 will follow in the near future.

CONCLUSION.

The clerical work connected with the clothing-supply branch of this office is always kept up to date, due to a faithful performance of the duties of the clerical force, which consists of 6 clerks, 1 inspector of textile fabrics, and 1 inspector of shoes. Both of the latter, by special authority of the Secretary of War, are carried on the rolls of the temporary force of the War Department. Their employment should be made permanent, as their services are of great benefit to the Department.

Very respectfully,

W. S. PATTEN,

Deputy Quartermaster-General, U. S. A.

The QUARTERMASTER-GENERAL, U. S. A.

REPORT OF THE SECRETARY OF WAR.

A.—Statement showing articles of clothing and equipage and material on hand at the issuing depots of the Quartermaster's Department in the United States, June 30, 1900, the quantities purchased, manufactured, received from posts and depots, taken up, sold, transferred to depots, expended, issued to the Army and the militia, and the quantities remaining in depots June 30, 1901.

Articles.	On hand June 30, 1900.	Pur- chased.	Manu- fac- tured.	Received from other depots.	Received from posts.	Gained.	Total received.	Sold.	Trans- ferred to other depots.	Expended or dropped.	Issued. To the militia.	To the Army.	Total.	Remain- ing on hand June 30, 1901.
Abdominal bands.	160,657			11,634	9,889	5	182,185	1,443	8,341	5	2,300	66,976	79,065	108,120
Agglutinettes and shoulder knots.	2,023	302		599	93		3,017	3	175		4	270	452	2,065
Blankets, woolen.	106,028	109,820		91,275	2,559	281	311,963	828	95,025	5,075	16,731	60,029	177,688	134,275
Blouses.														
Lined—														
Made.	125,152	1	127,608	45,791	4,615	270	308,437	336	81,814	217	17,456	54,989	154,792	148,642
Unmade.	1,388		17,383	55	55	8	18,834	9	742	8	122	16,847	17,728	1,106
Boots.	148,717		25,887	35,463	4,229	104	214,400	1,168	34,315	13,654	4,279	3,445	56,461	157,839
Leather.	19,118			3,246	5,788	3	28,255	28			124	885	1,082	27,228
Rubber.		1,219		5,088	250	6,021	12,575	20	75	8,525		2,494	12,085	12,085
Canvas fatigue coats.	139,117	6,150		15,008	725		161,025	20	10,544		1,086	28,845	38,545	122,040
Canvas fatigue trousers.	126,515	11,624		11,763	806	3	150,711	9	28,603	6	1,086	30,720	70,374	90,337
Cap.														
Canvas, blanket-lined.	5,108		21,874	15,607			42,589		24,809	3		3,397	28,209	14,380
Fur.	69,632	84,708		40,267	512		195,169	522	14,117	25	17,357	38,638	70,639	124,800
Muskat.	4,028	30,016		17,249			51,893	9	20,899			8,961	29,860	22,004
Cap ornaments.	411,745	238,117		46,572	13,734	172	770,640	74	29,198	1,602	27,406	49,011	107,286	668,354
Chevrons.														
Cloth.	62,300		39,715	13,106	2,420	2,611	120,152	1,040	18,617	2,465	14,277	28,459	64,834	55,294
Gold lace.	8,494		388	19	2,614	11	8,526	17	54	11	241	1,768	2,064	6,438
Knaki.	21,986		91,854	28,226	1,356	520	143,892	99	61,622	15		9,749	71,445	72,407
Coats.														
Mackinaw.	93						93					93	93	
Olefin.		120				71	191					191	191	
Uniform dress—														
Made.	25,490		188	12	4,763	71	30,514	81	12	165	8	1,971	2,237	28,277
Unmade.	2,281		86			162	2,690	96		102		72	269	2,421
Coat facings.	4,843		90	20	6,890	980	6,563	173	20	61		405	6,168	6,168
Collar, linen.	280,780	120,000		66,717	177		467,674	112	71,750	60		96,216	168,138	299,186
Drawers.														
Canton flannel.	214,371		176,835	55,600	6,539	1,215	454,560	183	141,869	12,180		109,920	263,002	190,968
Jeans.	184,091	377,409		49,507	3,682	33	614,722	128	318,965	11		65,996	884,798	229,798

QUARTERMASTER-GENERAL.

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[illegible]

A.—Statement showing articles of clothing and equipage and material on hand at the issuing depots of the Quartermaster's Department in the United States, etc.—Continued.

Articles.	On hand June 30, 1900.	Pur- chased.	Manu- fac- tured.	Received from other depota.	Received from posta.	Gained.	Total received.	Sold.	Trans- ferred to other depota.	Expended to dropped.	Issued. To the militia.	Total. Army.	Remain- ing on hand June 30, 1901.
Overcoat cape linings.....pairs	46,117	27,372	1,082	37,005	84	183	1,271	25	47,005	124	174	1,208	68
Overshoe article.....pairs	1,498	3,406		2,107	400	2	110,615	5	47,005	8		61,233	49,382
Pajamas.....pairs	86,562	3		63,372	5,889	25	155,801	1,243	73,477	116	11,888	40,240	28,787
Shirts:													
Chambray and gingham.....pairs	75,379	402,220	10	6,277	1,044	4,410	488,340	65	298,645	4,308		47,210	350,428
Dark blue flannel.....pairs	227,789		288,103	64,097	9,389	10	679,384	1,656	264,970	7	8,804	107,274	392,711
Khaki.....pairs	47		17,508			5,609	23,064	8	20,300	7		23,064	198,677
Muslin.....pairs	129,916	74,775		24,486	2,067		231,214	78	16,645	1		33,465	180,546
Shirt studs, bone.....pairs	275,792			13,070	3,383		289,165	12		391		6,880	291,882
Shoes:													
Barrack.....pairs	125,828			17,176	3,685	17	146,716	16	2,004	12		14,944	129,740
Black.....pairs	151,962	299,046		140,724	4,681	130	596,583	1,245	217,185	106	2	103,262	321,820
Black.....pairs	228,954	582,359		93,382	3,369	255	906,269	291	377,220	287		66,065	470,738
Shoe dressing.....pairs	38,428	500		8,338			45,266	1	475			6,454	38,812
Slickers.....pairs	100	1,256		1,153	672		3,181	1	720			1,041	1,419
Stable frocks.....pairs	22,984	9,879	11,585	6,968	880	3	52,239	13	10,365	11	58	11,055	30,737
Stockings:													
Cotton.....pairs	754,811	3,227,397	69	57,359	14,323	20,949	4,074,908	2,272	1,540,054	20,961		428,765	1,990,092
Woolen.....pairs	233,467	598,218		130,641	7,409	425	970,160	73	414,290	534		85,367	500,284
Summer coats.....pairs	162,585		1,078	12,923	1,819		178,485	78	6,102		100	6,710	161,906
Summer trousers.....pairs	162,273	205	1,071	11,407	2,029	5	176,980	134	8,812	5	173	8,329	159,447
Suspenders.....pairs	151,775	37,500		6,060	1,702		197,037	138	35,201	79		15,594	52,012
Sweaters.....pairs		134					134					134	134
Trousers:													
Engineer's—													
Made.....pairs	5,569			183	273	683	6,718	19		31		1,919	4,749
Unmade.....pairs	157		520				6,777					520	157
Foot—													
Made.....pairs	300,950	403	101,867	65,362	4,215	611	473,428	1,027	80,734	2,418	22,759	58,228	165,221
Unmade.....pairs	712		17,491		1	6	18,210	2	554	3		16,296	16,965
Mounted—													
Made.....pairs	83,559		33,603	31,756	2,128	127	151,173	104	27,212	325	1,189	16,922	45,826
Unmade.....pairs	1,307		4,860	66	52		6,275					6,146	5,147
Mackinaw.....pairs	91						91					44	44
Ollakin.....pairs						251	358					358	358
Trousers stripes.....pairs	17,612	107	34,946	16,419	1,559	1,623	72,059	263	14,633	49	15,923	28,204	54,002
Undershirts:													
Cotton.....pairs	218,100	688,752		243,850	4,788	1,200	1,286,690	79	496,896	3,140		117,944	618,571
Nainsook.....pairs	60,876						60,876		3,000			3,000	59,876
Nanken.....pairs	42,708	159,880			1,597	14,803	218,938	8	114,182	8		66,686	180,804

Woollen.	150,089	264,005	15,120	8	879,246	277	270,179	198	138,544	404,198	475,048
Woollen, fleece-lined	150	860	886	2,874	114,861	1	19,066	2,376	32	56,151	58,710
Woolen belts, leather	66,224	6,068	894	42	24,238	211	4,871	66	614	9,605	14,598
Axes	2,500	6,808	661	101	54,201	145	9,600	58	697	20,579	33,622
Ax halves	86,639	600	60	87	2,719	4	10,209	4	15	24,628	2,196
Ax slings	2,162	15,920	814	1	56,276	22	27,008	192	14,406	30,448	30,448
Barrack bags	35,741	3,300	217	11,325	114,688	578	27,008	6,880	21,808	66,777	107,921
Bedsteads	48,076	25,000	2,199	11,460	194,306	121	11	10,016	22,692	82,909	101,397
Bedsteads, iron	137,876	43,878	2,199	981	7,864	88	11	8	3,086	3,190	4,704
Books:	4,876	1,151	961	981	7,864	88	11	8	3,086	3,190	4,704
Company—											
Council	4,515	125	20	341	4,660		550		1	892	3,788
Letters received	3,497	370	36	20	3,903	5	575	4	42	1,048	2,860
Index	3,375	419	24	2	3,820		575	1	42	1,025	2,785
Letters sent	3,186	370	35		3,560	2	675	3	42	1,129	2,461
Index	3,387	370	21		3,778		675	1	42	1,127	2,661
Order	3,785	365	34	4	4,168	1	575	26	98	1,144	3,049
Post—											
Council of administration											
Letters received	686	25	1	3	915		225			283	652
Index	233	166			1,289	1	442	2	3	600	689
Letters sent	860	160			1,335		667		1	791	744
Index	297	116		1	913	1	242	2	107	352	561
Letters sent	860	215			1,275		487	1	92	580	685
Index	564	30	1	1	1,066		336	10	72	419	647
Order											
Regimental—											
Fund	724	62	1		767		100		10	144	643
Letters received	448	70	3	1	642	2	135	5	26	214	428
Index	560	72	3		775		135	2	26	208	567
Letters sent	494	95	4		683	11	135	2	36	210	393
Index	654	66	3		723		135	4	31	208	515
Order		70	3		444		135	9	20	208	241
Brooms, corn	17,678	41,216		19	75,607	3	33,715	390	27,286	61,614	13,893
Brushes, scrubbing	9,872	11,600			62,707		25,108	374	14,219	39,941	22,826
Bugles	458	160			682		60		17	84	598
Bunks, iron	30		12		42	11			10	22	22
Bunk card holders	24,660	2,000			26,660		77	1,303	9,366	9,366	17,394
Bunk bottoms, woven wire	8,896	1,000	235	154	5,806	45	3,068	4	835	2,360	3,446
Chairs, barrack	4,814	1,000	98	32	16,447	37			6,948	10,079	6,368
Colors:											
Camp	220	162	6		388		75		44	127	261
National	506	30			535		50		131	190	345
Regimental	13			16	83				24	43	6
Colors and guidons:											
Belts and slings for	246				245				16	23	39
Belts for	1,041				1,864				81	373	206
Stuffs for	12,437	2,618	1,404	83	91,646	318	79,900	89	197	82,796	9,049
Cot covers	42,600				42,600		80,000		673	30,000	12,500
Cot covers					1,182	2	48		77	155	1,027
Drums	1,067	86	17	1	1,287	8			28	94	1,193
Drum cases	190		10	5					71		

A.—Statement showing articles of clothing and equipage and material on hand at the issuing depots of the Quartermaster's Department in the United States, etc.—Continued.

Articles.	On hand June 30, 1900.	Purchased.	Manufactured.	Received from other depots.	Received from posts.	Gained.	Total received.	Sold.	Transferred to other depots.	Expended or dropped.	Issued.	Total.	Remaining on hand June 30, 1901.
Drumheads:													
Batter.....	1,072	1,563		4	24	45	2,708	23	516		59	157	1,953
Snare.....	381	1,072		4	32	23	1,512	24	215	23	38	156	1,056
Drum cords.....	236	2					238				20	58	78
Drum knee rests.....	41					33	74	49				49	25
Drum rods.....	361					357	718	285		248		521	197
Drum slings.....	7,738				19		7,757	125	1		95	34	7,601
Drum snares.....	4,392				15		4,407	90	16		6	5	4,306
Drumsticks.....	4,063				22	4	4,119	61			131	44	3,947
Drumstick carriages.....	2,245						2,249	1			71	1	2,176
Flags:	2,523	8		125	5	1	2,662				22	16	2,624
Garrison Hospital—													
Field.....	387	104		81			572		88	3	7	39	435
General.....	127	512		275	1	29	944		484	59	9	22	370
Post.....	310	310		140			479		171		3	4	301
Storm and recruiting.....	1,007	1,097		298			2,392	19	382	34	17	246	1,694
Flag huddards:	232	7,879		2,004	1	4	10,120	48	4,599	49	40	670	1,714
Garrison, post, and storm.....	2,067	152		560	1	8	2,788	18	650	189	12	324	1,193
Recruiting.....	718	12,250		200	1	3	13,172	1	7,746		10	208	7,965
Guidons:													
Ambulance.....	599	300		297			1,196	1	106	8	7	250	824
Artillery, cavalry, and Indian scouts.....	48	294		6	3		351		108	5	12	185	41
Hammocks.....	22,697				10	9	22,716	236	3,000			200	19,280
Hatchets.....	21,973	3,000		5,200	225	61	30,459	38	5,252	3		3,323	21,250
Hatchet helms.....	27,567	7,524		3,028	450	187	38,756	64	5,281	142	637	7,391	25,201
Hatchet slings.....	1,907			602		3	2,512	13	600		10	51	1,858
Kettles, camp.....	10,484	5,000		6,860	271	26	22,641	512	1,808		1,085	2,726	16,509
Litters, hand.....	2,675	2,521		1,555	12	3	6,766	383	615		78	1,402	4,294
Mattresses.....	26,710	6,000		5,046	529		38,285	59	9,413	4	66	3,078	25,075
Mess covers.....	19,216	21,679	750	27,725	4,252		73,623	75	9,701	10	21	23,843	33,650
Mess pans.....	47,927			6,715	618	144	55,404	1,534	7,099		2,087	6,346	16,068
Mosquito bars.....	69,817	40,168		32,885	1,850	552	145,272	330	42,690	20	138	20,794	63,912
Mosquito head nets.....	81,937			24,826	1,476	2	108,241				9	18,185	18,194
Pickaxes.....	9,597	15,342		15,342	355	8	25,302	625	7,000	17	252	2,918	14,490
Pickax helms.....	21,092			29,782	540	93	51,507	70	12,610		295	6,746	18,721
Pickax slings.....	2,317			200			2,517					214	2,303
Pillows.....	41,301			14,701	2,111	5	56,118	27	7,738		66	7,196	43,101
Pillowcases.....	78,243			16,352	80	23	114,648	71	4,333	37	140	16,328	50,909

Pillow sacks.....	36,997	4,002	1,800	6	42,705	5	.....	.....	.....	600	3,026	8,682	39,073
Shovels, long-handled.....	16,707	3,640	118	.....	25,465	26	1,682	.....	10	234	1,878	8,880	21,635
Shovels, short-handled.....	19,691	12,007	106	41	80,222	102	7,078	.....	422	415	2,514	10,581	19,691
Spades.....	16,866	5,201	218	52	26,857	276	1,400	.....	42	209	4,842	6,793	22,108
Spade shovels.....	129	200	42	.....	26,877	.....	.....	.....	.....	.....	15	57	320
Stencils.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Alphabets.....	4	.....	.....	.....	104	2	.....	.....	.....	.....	100	102	2
Boxes, complete.....	2,347	.....	.....	.....	2,347	.....	55	.....	4	98	101	253	2,094
Company marking stamps.....	70	.....	13	9	294	32	3	.....	9	15	180	239	15
Numbers.....	17	.....	.....	2	19	.....	.....	.....	.....	.....	.....	.....	19
Tents.....	11,657	3,289	2,467	764	20,610	1,386	4,217	.....	48	3,140	1,257	10,048	10,562
Common.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Conical wall.....	.....	2,433	.....	.....	766	.....	.....	.....	.....	.....	.....	.....	.....
Improved pattern.....	666	100	.....	.....	10,714	209	2,982	.....	.....	.....	36	790	.....
Regulation pattern.....	5,187	3,085	562	100	10,714	209	2,982	.....	.....	.....	36	790	.....
Hospital.....	7,439	1,750	664	9	9,553	105	1,920	.....	2	443	3,980	5,647	8,167
Water barrels.....	82,732	37,654	9,392	39	184,373	6,893	69,853	.....	1,320	269	3,679	5,874	8,167
Water barrels.....	6,304	4,366	648	46	14,283	526	2,857	.....	1,045	9,717	62,701	140,319	44,064
Tent chairs.....	6,941	2,921	.....	15	7,766	126	475	.....	245	4,027	1,992	9,647	4,637
Tent files.....	8,405	269	610	18	10,758	245	2,498	.....	1,884	140	84	2,709	5,047
Hospital.....	8,505	2,648	686	27	14,085	365	2,326	.....	1,333	343	512	4,871	5,887
Wall.....	.....	.....	.....	.....	.....	.....	.....	.....	55	3,284	1,353	7,383	6,712
Tent pins.....	466	10,499	15,577	150	21,115	759	16,000	.....	.....	.....	276	16,276	4,839
Shelter.....	624,110	55,635	.....	435	696,757	.....	51,712	.....	2,585	45,999	207,804	306,559	386,898
Wooden.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Large.....	487,162	48,801	1,220	2,585	687,281	1,911	84,870	.....	27,039	80,462	58,799	253,081	434,200
Small.....	1,024,376	326,932	23,719	3,287	1,738,471	12,223	162,436	.....	52,507	149,744	312,425	689,335	1,049,136
Tent poles.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Common.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Ridge.....	42,202	4,253	2,830	30	49,315	240	6,006	.....	229	3,433	768	10,674	38,641
Upright.....	81,371	8,279	5,788	345	96,786	408	11,999	.....	154	6,826	1,522	20,949	74,837
Conical wall.....	6,171	3,128	547	94	11,140	138	3,643	.....	16	460	3,392	7,649	3,491
Hospital.....	11,211	2,242	1,108	29	14,590	221	1,215	.....	1,360	315	355	8,466	11,124
Ridge.....	22,354	4,479	2,099	678	28,910	456	2,430	.....	4,002	627	593	8,098	21,812
Upright.....	102,312	8,136	4,727	667	212,042	214	7,200	.....	80	8,503	40,386	56,383	155,659
Shelter.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Wall.....	15,272	5,160	1,107	42	21,831	334	5,293	.....	896	4,216	1,758	12,407	9,174
Ridge.....	21,840	4,240	1,667	366	27,980	663	4,658	.....	1,603	8,464	3,397	18,405	19,055
Upright.....	.....	.....	1	8	6,252	.....	10	.....	5,038	.....	21	.....	.....
Tent pole sockets.....	.....	.....	.....	.....	4,627	.....	.....	.....	1,587	.....	.....	1,587	1,202
Tent rings.....	6,250	.....	.....	.....	9,437	.....	.....	.....	.....	.....	.....	3,040	2,970
Tent rings, asbestos.....	4,527	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	6,397	.....
Tent rings, asbestos.....	325,384	6,000	252	11	333,384	.....	3,000	.....	155,742	.....	40	165,206	166,178
Tent straps.....	15,946	2,000	.....	.....	3,164	.....	650	.....	.....	.....	764	2,232	8,932
Tent stoves.....	625	2,384	.....	.....	3,009	.....	.....	.....	.....	.....	1,581	2,232	14,690
Tent stovepipe.....	56,389	17,500	1,269	104	75,079	23	2,632	.....	2	21	1,722	4,399	47,933
Tent tripods.....	2,625	2,199	563	5	11,692	138	15,426	.....	2,696	48	9,110	27,311	47,933
Trumpets.....	2,248	1,384	53	.....	11,692	22	2,673	.....	1,444	456	3,370	8,081	8,511
Trumpet cords and tassels.....	4,413	2,531	88	84	9,406	169	3,319	.....	32	739	823	2,107	1,388
Trumpet crooks.....	2,480	200	9	28	2,719	2	200	.....	.....	57	56	515	2,404

A.—Statement showing articles of clothing and equipage and material on hand at the issuing depots of the Quartermaster's Department in the United States, etc.—Continued.

Articles.	On hand June 30, 1900.	Pur- chased.	Manu- fac- tured.	Received from other depots.	Received from postal depos.	Gained.	Total received.	Sold.	Trans- ferred to other depots.	Expended or dropped.	Issued. To the militia. Army.	Total.	Remain- ing on hand June 30, 1901.
Trumpet mouthpieces	1,795	2		400	4	2	2,203		370		9	47	1,776
Whistles	1,824	5,500		3,500	325		11,149	3	4,033		134	5,765	5,384
Material.													
Buttons, all kinds	30,173,467	9,411,696		3,090,508	6	13,996	42,689,673	418	3,050,272	9,445,294	10,840	12,496,883	29,792,790
Cloth:													
Blanket lining	40,839						40,839			12,439	108	12,545	28,894
Dark blue	9,632	1,013		2,343		38	13,028	1,219	2,365	1,456	1,077	6,447	6,579
Facing	38,658	17,601		1,287			52,546	40	416	4,171	1,376	6,053	46,543
Italian	16,667	65		1,500			17,222	19	685			956	16,266
Drilling	257,710	208,622		301,262			667,614	1	301,262	346,602		547,885	119,729
Duck:													
Bleached	168,929	5,509					174,438		167	7,984		8,151	166,267
Brown	271,659	212,765				2,036	486,470	438		107,256	161	107,855	378,615
Tent	781,144	917,349					1,698,493	137	380	796,022	51	796,590	901,903
Flannel:													
Blouse	130,773	214,725		120,025	63	7,093	472,679	180	120,026	229,595	680	350,491	122,188
Blouse lining	209,910	67,729		66,317	31	7,007	350,994	1,614	92,252	227,573	388	321,827	29,167
Canton	206,120	310,641		335,778	394	112,577	965,500	66	335,779	423,481	679	760,406	205,095
Shirting and cape lining,													
yards	195,368	683,949		269,760	112	53,564	1,202,773	125	280,969	693,544	610	975,268	327,506
Overcoat lining	107,528	167,839				12,000	287,467	4		92,113	25	92,142	146,325
Jeans:													
Corset	474,000	11,766		79,150			564,916	6	79,154	150,797	11	229,968	334,948
White	320,843						320,843			19,965		19,965	300,878
Kersey:													
Dark blue	24,899	5,514		54,237	72	17	80,413	10	54,239	718	9	737	29,576
Sky blue	547,073	294,236		61,414			895,635	93	895,635	431,076	733	486,141	409,494
Khaki material	642,116	4,222,201		61,414			4,925,731	704	8,294	4,566,929	5,013	4,580,640	344,701
Lace, gold	6,867	3,869					10,736	3	1,035	639		847	1,042
Lasting	158,266			20,256			178,522	2	10,128	1,249		11,379	167,143
Muslin	186,889	62,079		19,991		6,074	275,033	22	19,991	188,706		174,719	107,514
Naphthaline	58,404	2,000		60,404		60	61,404		4,612	23,271	800	31,018	29,446
Padding	506,261	25		37,719		3,495	547,500		37,744	222,288		260,032	286,468
Paper:													
Petroleum	102,512	15,000				68	117,580	25	150	110,020	983	111,178	6,402
Tissue	297	30				10	337					123	314
Wrapping	507,090	1,065		25,005		28	608,828			1,072	67	1,139	504
Silesia	507,090	1,065		25,005		76,719	608,828		25,040	131,709		156,798	432,030
Wadding	96,900	85		1,560			100,490		1,560	2,868		3,963	96,517

Musical instruments.

Musical instruments.									
Altoes.....	40	31							48
Bartones and euphonium.....	14	20							21
Bassos.....	32	34							40
Clarinets.....	20	79							52
Cornets.....	35	57							46
Cymbals.....	69	1							2
Drums, bass.....	62	1							7
Flugelhornis.....	1	1							12
Flutes.....	4								14
Piccolos.....	12	9							5
Saxophones.....	6	6							9
Triangles.....	10	1							60
Trombones.....	69	1							68
	63	33							57
Parts of musical instruments.									
Bags.....	533		176						482
Batons.....	8								14
Cases.....	184	1							2
Cords, bass-drum.....	83	2							52
Drumheads, bass.....	328	393							322
Mouthpieces.....	209	232							389
Music holders.....	309	21							237
Music stands.....	2, 361	10							1, 904
Pads.....	76, 438	4, 666							54, 173
Reeds.....	45, 239	3, 636							22, 983
Shakos.....	6	1							38, 840
Springs.....	5, 437	2, 336							2, 634
Sticks, bass-drum.....	73	28							54

B.—Statement showing articles of clothing and equipage and material on hand at the issuing depots of the Quartermaster's Department in Cuba, Hawaii, Porto Rico, and the Philippine Islands, June 30, 1900, the quantities purchased, manufactured, received from posts and depots, taken up, sold, transferred to depots, expended, issued, and the quantities remaining in depots June 30, 1901.

Articles.	On hand June 30, 1900.	Pur- chased.	Manufac- tured.	Received from other depots.	Received from posts.	Gained.	Total re- ceived.	Sold.	Trans- ferred to other depots.	Expend- ed or dropped.	Issued.	Total.	Remain- ing on hand June 30, 1901.
Abdominal bands	48,013			37,465	3,615		89,068	36	9,600		23,654	33,290	55,903
Alguillettes and shoulder knots	120						120	24				24	96
Blankets, woolen	15,592			42,283	898	254	59,027	43	2,575	4	23,248	25,870	33,137
Blouses:													
Lined—													
Made	20,912			58,782	181		79,875		12		57,580	57,592	22,293
Unmade	1,691						1,691					492	1,199
Unlined—													
Made	27,981			2,132	1,067	5	31,185	6	5,165	250	5,294	10,715	20,470
Unmade	1,268			94	56		1,418	2			534	536	882
Boots:													
Calfskin	4,974				56		5,030	2	4,432			4,434	566
Rubber	2,954			4,751	611		8,320	11	137		2,839	2,987	6,333
do.	4,788			2,901	159	10	7,838		990		3,994	4,984	2,850
Brassards	48,178			13,605	1,829	323	63,935	3	7,185		17,520	24,708	39,227
Canvas fatigue coats	44,884			29,965	1,655	78	76,562	30	4,850		24,996	29,876	46,706
Canvas fatigue trousers				819			819						819
Cape, canvas, blanket-lined				6,945	1,264		8,209						
Cape, fur	13,295			475			13,770						
Cape, fur	397,784			325,656	729		714,169	19	1,405		280,102	281,526	432,643
Cap ornaments, all kinds	51,759			62,894	1,885	2	105,548	49	6,532	6	53,168	59,776	46,815
Chevrons, all kinds	112,948			30,325	1,633	5	145,111	171	28,305	1	36,773	65,250	79,861
Collars, linen													
Drawers:													
Canton flannel	8,860			110,156	294		119,310	58	1,578		39,675	41,311	77,999
Cotton, knit	77,547			7,646	400	37	85,593	272	7,106	49	34,845	42,772	43,354
Jean	48,774			307,747	1,143		357,664	564	2,648	48	151,967	155,217	202,477
Nanken	53,992			136,559			190,541				124,346	124,346	66,196
Wool, knit	754			106			860				798	798	72
Gauntlets:													
Buckskin	9,172			24,667	1,895	18	35,662	50	3,479		16,172	19,701	16,961
Muskat	200			200			200						200
Gloves, Berlin	142,715			53,250	5,844		201,809	75	950		65,120	66,145	135,664
Hats:													
Campaign	63,480			268,053	2,067	84	333,644	244	1,943	3	167,023	169,213	164,471
Panama				1,520			1,520	60				133	133
Southwester	3,213						3,213				452	452	2,756
East cords	77,087			197,314	1,879		276,280	20	2,570	4	202,329	204,923	71,307
Helmeta cork	53,225						53,225				24,059	31,899	37,486
Khaki coats	78,441			328,989	7,485	384	415,259	1,581	20,209	250	164,914	185,954	228,305

Khaki trousers.....pairs.	116,178	6,509	109	688,704	589	17,298	2,799	314,318	382,155	886,609
Khaki shoulder straps, extra.....do.	13,308	2,048	17	208,000	1,492	6,853	2,799	86,835	97,479	170,621
Leggins.....do.	65,841	437,107	233	604,552	111	1,084	2,799	810,127	817,272	187,280
Music pouches.....do.	213	2,194	99	2,407	59	25	25	3	28	2,879
Neckties.....pairs.	8,582	1,215	99	11,824	59	1,200	59	4,692	5,951	6,873
Overalls.....pairs.	9,029	3,533	99	13,257	7	8,209	7	4,679	7,865	6,862
Pajamas.....pairs.	4,898	4,761	940	10,099	176	2,778	176	8,768	4,222	6,877
Overcoats.....pairs.	4,287	13,463	327	18,077	1	2,804	1	8,828	6,133	11,944
Overhoes, arctic.....pairs.	682	100	782	782	12	2,666	12	42,604	46,132	41,128
Ponchos, rubber.....pairs.	44,152	41,762	38	87,310	14	1,160	14	1,194	1,868	8,825
Slickers.....pairs.	3,699	844	150	4,693	14	1,160	14	1,194	1,868	8,825
Shirts:										
Chambray.....pairs.	57,784	158,198	20	214,237	394	6,783	394	173,136	180,313	33,924
Dark blue flannel.....pairs.	51,019	317,060	83	370,221	80	4,928	80	145,625	160,586	219,686
Gingham.....pairs.	60,029	26,298	83	96,327	234	2,304	234	65,335	65,335	20,992
Muslin.....pairs.	43,821	2,922	969	47,702	234	2,304	234	13,986	16,584	31,168
Shirt studs, bone.....pairs.	58,105	2,575	969	55,680	234	19,824	75	6,659	26,556	29,122
Shoes:										
Black.....pairs.	41,104	8,488	658	90,250	27	26	27	19,721	19,774	30,476
Black.....do.	52,080	162,528	52	217,012	59	1,550	59	96,243	96,862	130,161
Russet.....do.	111,756	345,181	2,074	459,011	177	3,928	177	198,540	202,645	256,366
Shoe dressing.....packages.	16,730	23,175	6,762	46,667	7	6,912	27	3,469	10,408	36,259
Shoe laces.....pairs.	178,618	284,652	1,342	43,270	9	12,900	9	67,861	80,768	862,502
Stable frocks.....pairs.	6,799	6,015	1,342	14,156	9	1,901	9	4,346	6,256	7,900
Stockings:										
Cotton.....pairs.	135,070	1,892,535	2,628	2,020,328	1,195	11,484	1,195	878,136	890,815	1,129,513
Woolen.....do.	1,610	515,287	156	517,063	21	110	36	328,315	328,962	188,071
Summer coats.....pairs.	87,410	24,645	2,421	114,476	186	6,150	186	12,854	19,300	95,276
Summer trousers.....pairs.	78,198	30,823	1,634	110,655	290	150	290	12,541	12,961	97,674
Suspenders.....do.	19,300	37,747	720	57,778	191	150	191	25,942	26,133	31,640
Trousers, kersey:										
Made.....do.	41,134	68,652	4,130	113,916	106	18,713	2	71,149	89,970	23,946
Unmade.....do.	5,914	4,313	265	6,179	4	1,064	4	1,064	1,068	6,111
Trousers stripes, all kinds.....do.	33,714	4,313	1,488	39,515	29	5,431	29	6,271	10,731	28,784
Undershirts:										
Cotton.....pairs.	70,967	400,237	2,284	478,560	567	9,563	15	130,780	140,985	232,625
Nankeen.....pairs.	66,564	116,464	2,284	183,028	5	785	5	99,706	99,711	83,317
Woolen.....pairs.	66,725	98,085	2,610	167,420	92	785	30	77,703	78,670	84,750
Waist belts, leather.....pairs.	76,501	24,565	112	101,178	7	292	7	58,443	58,742	42,486
Axes.....pairs.	2,854	2,854	314	11,144	44	693	44	6,333	7,070	4,074
Ax helms.....pairs.	26,567	4,014	255	30,836	72	272	72	22,959	23,303	7,533
Ax slings.....pairs.	69	1,972	153	61,322	52	2,000	1	12,478	14,474	46,948
Barrack bags.....pairs.	59,197	10,418	88	13,437	52	2,000	1	2,027	2,053	11,354
Bed sacks.....pairs.	3,019	662	1,960	47,501	585	3,000	94	7,874	11,553	36,948
Bed sheets.....pairs.	44,791	75	1,684	3,107	496	1,550	21	2,107	2,107	1,000
Bedsteads, iron, with woven wire bottoms.....pairs.	1,348	500	12	1,839	20	20	20	257	257	1,082
Books:										
Company.....	827	827	17	1,784	20	20	20	927	927	584
Council.....	889	889	17	1,406	20	20	20	802	802	584
Letters received.....	789	600	17	1,406	20	20	20	802	802	584
Index.....	789	600	17	1,406	20	20	20	802	802	584

B—Statement showing articles of clothing and equipment on hand at the various depots of the Quartermaster's Department in Cuba, March.

B.—Statement showing articles of clothing and equipage and material on hand at the issuing depots of the Quartermaster's Department in Cuba, Hawaii, Porto Rico, and the Philippine Islands—Continued.

Articles.	On hand June 30, 1901.	Pur- chased.	Manufac- tured.	Received from other depots.	Received from posts.	Gained.	Total re- ceived.	Trans- ferred to other depots.	Expend- ed or dropped.	Issued.	Total.	Remain- ing on hand June 30, 1901.
Books—Continued.												
Company—Continued.												
Letters sent.....	299			1,000	25		1,324	20		477	497	827
Index.....	380			900	19		999	20		213	233	766
Order.....	497			800	15		1,312	15		564	599	713
Post—												
Council of administration.	227			550	6		783			395	395	396
Letters received.....	124			500	5		629	19		324	343	296
Index.....	71			500	23		594			480	490	114
Letters sent.....	140			524	9		673			490	490	183
Index.....	142			390	11		533			368	368	165
Order.....	162			274	2		438			79	79	359
Regimental—												
Fund.....	182			145	3		330			177	177	153
Letters received.....	49			145	7	6	206			124	124	82
Index.....	55			145	6	6	211	2		125	127	84
Letters sent.....	65			145	4	3	217			129	129	88
Index.....	76			145	4	2	227	1		131	132	95
Order.....	318			145	3	4	470			295	295	175
Brooms, corn.....	11,250	24		34,599	156		46,086	102	548	39,814	41,044	4,922
Brushes, scrubbing.....	9,352			24,728	457		34,517	15	270	32,510	33,079	1,438
Bugles.....	58			10			68		202	590	792	51
Bunk-card holders.....	4,179			809	68		5,056		174	6,524	6,718	7,810
Chairs, barrack.....	3,270			10,563	696		14,528	20		23	23	41
Color belts and slings.....	64						64			23	23	136
Colors, camp.....	173			31	12		216	42		38	40	156
Cots.....	8,384			61,144	1,486		71,016	597		60,631	51,228	19,788
Cot covers, extra.....				10,000			10,000			3,562	3,562	6,418
Cot end sticks, extra.....				10,000			10,000			6,000	6,000	4,000
Drums.....	29			31	5	21	114		1	6	43	18
Drumheads.....	83				7		27			53	59	55
Drum slings.....	20						27			8	8	19
Drum snares.....	22					2	24			2	2	22
Drumsticks.....	63			16	7		86			17	18	68
Files.....	214			7	7		228	125	9	10	144	84
Flags.....												
Garrison.....	48			141	1		190	6		98	104	86
Hospital.....												
Field.....	66			179	4		249	1		80	81	168
General.....	28			34	1		78	1		25	27	46

Post	180	864	8	1,002	8	8	11	962	876	126
Storm and recruiting	2,108	8,151	22	10,279	8	48	57	6,327	6,485	8,844
Flag balyards	239		21	202			5	28	28	284
Guidons:										
Ambulance.....	408		7	416		55		7	62	364
Cavalry.....	28			130				100	107	43
Hammock.....	8,630	1,089	1,707	15,289	10	2,805	344	5,725	8,884	6,485
Hatchets.....	8,716	1,490		10,719				312	612	1,597
Hatchet halves.....	8,923	6,574	948	10,719		259	7	988	1,099	9,546
Hatchet knives.....	16,415	4,014	255	20,683		238	44	16,909	17,211	8,474
Hatchet slings.....	3,212	171		3,383						353
Kettles, camp.....	3,458	1,620	145	5,083		216	73	3,099	3,578	2,235
Mattress.....	1,130	201	145	2,736				4	1,553	1,923
Mattress covers.....	13,479	531	1,732	15,736		6,000	83	8,111	9,151	6,864
Mess pans.....	8,512	2,814	666	12,796		1,460	85	1,800	2,890	6,618
Mosquito bars.....	95,381	89,495	886	66,072		1,283	1,120	58,406	57,063	9,007
Mosquito head nets.....	37,458	14,542		52,000		3,283		7,063	7,063	44,985
Pickaxe.....	16,890	1,198	225	17,894		184	6	2,815	3,423	4,474
Pickaxe halves.....	1,551	1,411	849	3,791			14	13,218	13,376	4,606
Pillows.....	1,284	5,634	2,136	9,093		593	269	6,886	1,279	2,849
Pillowcases.....	20,794	8,288		28,303		15,000		6,031	22,253	6,240
Pillow sacks.....	40			4						8,868
Pots, iron.....	16	1,000	12	1,002		2	4	192	218	814
Shovels, long handled.....	2,473	2,840	139	4,952		108	66	1,606	1,780	3,172
Shovels, short handled.....	4,098	5,130	674	10,895		1,062	7	6,876	6,445	4,455
Spades.....	3,218	1,786	112	6,125		644	4	814	1,462	8,663
Spade slings.....	10			13						10
Stamps, company marking.....										13
Stencils, in boxes, complete.....	385	13	10	405		15,000	9	103	112	288
Tents:										
Common.....	3,692	2,773	33	6,023		456		2,008	2,464	8,559
Conical wall.....	2,031	1,141	11	3,183				923	923	2,660
Hospital.....	1,639	1,149	101	3,879		83	2	1,574	1,659	1,220
Shelter halves.....	5,880	29,339	262	36,445		973	211	12,956	14,140	21,316
Wall.....	667	367	47	1,411			4	170	174	1,237
Tent flies:										
Hospital.....	1,165	1,876	82	3,123		80	4	1,048	1,132	1,991
Wall.....	1,106	737	18	1,851		397	2	312	711	1,170
Tent pins:										
Wooden.....										
Large.....	83,684	11,256		11,256				4,676	4,676	6,580
Small.....	285,953	54,671	6,613	95,065		5,380		36,704	42,084	52,932
Shelter.....	67,387	130,112	9,273	446,140		60,940	286	43,244	104,480	942,160
Tent poles:										
Common—										
Ridge.....	3,803	2,141	984	6,928	508	436	14	244	1,217	5,711
Upright.....	8,021	4,847	2,294	18,162	1,066	912	166	770	2,914	12,245
Conical wall.....	2,202	1,151	47	3,422	1			350	851	3,071
Hospital—										
Ridge.....	1,649	1,095	429	3,173		83	29	1,314	1,436	1,747
Upright.....	3,652	2,316	922	6,790	94	166	77	3,054	3,901	3,789

B.—Statement showing articles of clothing and equipage and material on hand at the issuing depots of the Quartermaster's Department in Cuba, Hawaii, Porto Rico, and the Philippine Islands, etc.—Continued.

Articles.	On hand June 30, 1900.	Pur- chased.	Manufac- tured.	Received from other depots.	Received from posts.	Gained.	Total re- ceived.	Sold.	Trans- ferred to other depots.	Expend- ed or dropped.	Issued.	Total.	Remain- ing on hand June 30, 1901.
Tent poles—Continued.													
Shelter	51,321			12,857	3,644	7,622	75,444		10,240	3,696	47,321	61,257	14,187
Wall—													
Ridge	3,146			907	309		4,362	42	2,185		173	2,400	1,962
Upright	6,202			1,676	507		8,385	54	754		683	1,445	6,940
Tent stoves	617			245	72	8	942		284		763	921	21
Tent tripods	4,158			100	462	331	5,051		4,227	74	210	4,511	540
Trumps	2,110			933	48	22	3,113	4			104	1,004	3,005
Trumpets	470			701	6		1,177			6		850	317
Trumpet cords and tassels	806			2,239	16		3,060		4	11	2,096	2,186	844
Trumpet crooks	1,279			450			1,729		79		189	1,899	1,540
Trumpet mouthpieces	1,131			575		10	1,719				759	1,759	960
Whistles	663			3,033	122		3,818				2,486	2,486	1,339
Materials.													
Buttons	24,280			25,076	1,567		50,923	1,135	14,686		2,402	18,233	32,680
Cloth													
Dark blue	40			36			76	48			14	62	14
Khaki	109			1,002	20		2,031	355	110		532	997	134
Flannel blouse	40						40	24			11	35	5
Kersey	51			50			101	87			10	47	54

C.—Statement showing articles of clothing pertaining to the United States Army transport service on hand at the San Francisco and New York depots of the Quartermaster's Department June 30, 1900, the quantities purchased, received from transports and depots, sold, transferred to depots, expended, issued to the transport service, and the quantities remaining in depots June 30, 1901.

Articles.	On hand June 30, 1900.	Purchased.	Received from other depots and from transports.	Total received.	Sold.	Transferred to other depots.	Expended.	Issued to transport service.	Total.	Remaining on hand June 30, 1901.
Aprons.....	824	2,228	560	3,612	.....	560	.....	2,548	3,108	504
Capes, all kinds.....	3,482	868	160	1,480	19	160	.....	2,907	3,056	1,424
Cap ornaments.....	71	870	860	1,801	19	860	.....	90	3,099	1,832
Cap ribbons.....	6,570	3,626	.....	10,196	44	.....	1	3,863	3,806	6,383
Chevyrons.....	1,020	1,181	242	12,457	5	242	.....	680	9,727	1,530
Coats, jackets, and jumpers.....	4,687	6,651	2,140	13,448	149	675	.....	8,901	9,725	8,725
Hats.....	2,582	1,960	380	1,942	13	380	.....	2,172	2,455	2,372
Kanyards.....	504	800	.....	1,304	7	.....	.....	1,247	1,304	.....
Neckties.....	1,248	500	.....	1,748	6	.....	.....	1,460	1,666	82
Overalls.....	1,091	445	893	2,429	7	126	10	1,482	1,614	915
Trousers, all kinds.....	6,410	4,394	1,758	11,562	123	1,133	1	6,778	8,037	3,525

WAR DEPARTMENT,
QUARTERMASTER-GENERAL'S OFFICE,
Washington, September 6, 1901.

GENERAL: I have the honor to submit my report of operations of the business coming under my charge in your office for the fiscal year ending June 30, 1901, pertaining to the following-named subjects: Finance, money accounts, returns of quartermaster supplies, mail and record, and national cemeteries.

FINANCE.

This branch is charged with all matters relating to the procurement and distribution of funds, compilation and preparation for Congress of the annual estimates of appropriations required for the service of the Quartermaster's Department and for the Quartermaster-General's Office, the examination of estimates of funds received from disbursing officers, action upon settlements made at the Treasury of claims and accounts pertaining to the Quartermaster's Department, etc.

Attention is respectfully invited to the accompanying statements, showing in detail the balances on hand at the commencement of the fiscal year, the amounts credited from the appropriations, sales, etc., the remittances to officers, amounts paid out on account of settlements, the amounts carried to the surplus fund, etc.

Financial statement for fiscal year ending June 30, 1901.

[From the balance books in which all debits and credits are recorded.]

Appropriations.	Balance in Treasury undrawn July 1, 1900.	Appropriated.		Placed to credit of appropriations during the year being the proceeds of sales to officers, etc.	Placed to credit of appropriations during the year by Treasury transfer warrants.	Total to be accounted for.	Remitted to disbursing officers.	Paid on settlements made at Treasury of claims and accounts.	Amounts charged against appropriations by Treasury transfer warrants.	Amounts carried to surplus fund act June 20, 1874.	Balance in Treasury undrawn June 30, 1901, and available for outstanding obligations.	Total accounted for.
		Amount.	Date of act.									
1898 and prior years.												
Regular supplies.....				\$3,571.01		\$3,571.01				\$3,571.01		\$3,571.01
Incidental expenses.....				593.87		593.87				593.87		593.87
Horses for cavalry and artillery.....				100.00		100.00				100.00		100.00
Barracks and quarters.....				210.59		210.59				210.59		210.59
Transportation of the Army and its supplies.....				11,749.72		11,749.72				11,749.72		11,749.72
Clothing and camp and garrison equipage.....				160.27		160.27				160.27		160.27
National cemeteries.....				2,786.66		2,786.66				2,786.66		2,786.66
Repairing roads to national cemeteries.....				321.69		321.69				321.69		321.69
Headstones for graves of soldiers.....				38.55		38.55				38.55		38.55
Burial of indigent soldiers.....				260.00		260.00				260.00		260.00
Road to national cemetery, Pensacola, Fla.....				11.61		11.61				11.61		11.61
Total.....				19,803.97		19,803.97				19,803.97		19,803.97
1899.												
Regular supplies.....	\$4,174,348.19			242,200.68		4,416,548.87	671.96	\$8,892.07	\$1,500,000.00	2,906,984.82		4,416,548.87
Incidental expenses.....	1,040,686.45			103,159.05		1,143,795.50	313.64	18,679.73	100,000.00	1,024,892.13		1,143,795.50
Horses for cavalry and artillery.....	411,695.97			73.78		411,769.70			300,000.00	111,769.70		411,769.70
Barracks and quarters.....	1,128,981.67			109,479.81		1,238,461.48	385.16	3,343.28		1,234,733.04		1,238,461.48
Transportation of the Army and its supplies.....	7,156,938.70			355,563.89		7,510,502.59	872,669.52	322,153.40	4,000,000.00	2,315,679.67		7,510,502.59
Clothing and camp and garrison equipage.....	2,033,349.80			263,399.44		2,296,619.24		822,041.50	1,500,000.00	795,797.20		2,296,619.24

Financial statement for fiscal year ending June 30, 1901—Continued.

Appropriations.	Balance in Treasury undrawn July 1, 1900.	Appropriated.		Placed to credit of appropriations during the year, being the proceeds of sales to officers, etc.	Total to be accounted for.	Paid on settlements made at Treasury and accounts.	Amounts charged against appropriations by Treasury transfer warrants.	Amounts carried to surplus and set June 30, 1894.	Balance in Treasury undrawn June 30, 1901, and available for outstanding obligations.	Total accounted for.
		Amount.	Date of act.							
1899—Continued.										
Construction and repair of hospitals	\$460.21			\$272.94	\$733.15			\$733.15		\$733.15
National cemeteries	7,479.45			1,161.16	8,640.61			8,640.61		8,640.61
Pay of superintendents of national cemeteries	587.83				587.83			587.83		587.83
Shooting galleries and ranges	3,313.02			96.36	3,409.38			3,409.38		3,409.38
Quarters for hospital stewards	290.94			62.08	352.62			352.62		352.62
Military posts	63,757.40			175.57	63,932.97			63,932.97		63,932.97
Repairing roads to national cemeteries	250.88			290.35	540.23			540.23		540.23
Burial of indigent soldiers	1,357.20				1,357.20			1,357.20		1,357.20
Headstones for graves of soldiers	13,092.45			332.96	14,025.41			9,379.08		14,025.41
Road to national cemetery, Presidio of San Francisco, Cal.	64.54				64.54			64.54		64.54
Road to national cemetery, Natchez, Miss.	498.30				498.30			498.30		498.30
Military post, Bismarck, N. Dak.	243.80				243.80			243.80		243.80
Sewerage system, Fortress Monroe, Va.	687.01				687.01			687.01		687.01
Improvement of Yellowstone National Park	20.00				20.00			20.00		20.00
Antietam battlefield preservation				.35	.35			.35		.35
Improving Oak Hill cemetery, Evansville, Ind.				26.82	26.82			26.82		26.82
Total	16,038,671.81			1,074,165.79	17,112,837.60	879,204.89	353,894.80	7,400,000.00	8,479,738.41	17,112,837.60

Appropriations for deficiencies, Jan. 1, 1890.						
Regular supplies.....	603,494.69	124,943.15	738,437.84	2,946.66	735,491.18	738,437.84
Incidental expenses.....	402,863.66	11,400.11	414,263.77	4,916.38	409,019.15	414,263.77
Horses for cavalry and artillery.....	62,403.71	.....	62,403.71	75.00	62,328.71	62,403.71
Barracks and quarters.....	22,000.88	1,949.47	23,950.35	1,861.84	22,088.46	23,950.35
Transportation of the Army and its supplies.....	675,476.93	55,048.97	730,525.90	75,862.96	539,983.04	730,525.90
Clothing and camp and garrison equipage.....	544,691.50	6,900.06	551,591.56	5,329.50	546,262.09	551,591.56
Total.....	2,310,931.32	210,241.79	2,521,173.11	115,008.12	2,315,172.63	2,521,173.11
1900.						
Regular supplies.....	2,914,419.14	400,672.35	3,315,091.49	3,233.72	3,311,857.77	3,315,091.49
Incidental expenses.....	907,480.41	185,231.56	1,092,711.99	48,168.52	1,044,543.47	1,092,711.99
Horses for cavalry and artillery.....	355,071.20	85,641.57	440,712.77	61,159.23	379,553.54	440,712.77
Barracks and quarters.....	1,506,253.51	290,162.78	1,796,416.29	3,639.94	1,792,776.35	1,796,416.29
Transportation of the Army and its supplies.....	8,079,710.59	1,815,044.63	9,894,755.22	623,612.85	9,271,142.37	9,894,755.22
Clothing and camp and garrison equipage.....	2,721,622.65	798,037.42	3,514,660.07	4,706.29	3,509,953.78	3,514,660.07
Construction and repair of hospitals.....	134,375.48	23,890.67	158,266.15	.....	158,266.15	158,266.15
National cemeteries.....	1,985.11	920.19	2,905.30	381.51	2,523.79	2,905.30
Pay of superintendents of national cemeteries.....	1,260.68	361.18	1,621.86	.....	1,621.86	1,621.86
Shooting galleries and ranges.....	2,212.78	2,079.26	4,292.04	1,414.83	2,877.21	4,292.04
Quarters for hospital stewards.....	3,045.50	3,401.43	6,446.93	.....	6,446.93	6,446.93
Military posts.....	392,622.75	37,016.97	429,639.72	361,224.44	69,415.28	429,639.72
Repairing roads to national cemeteries.....	49.88	131.11	180.99	.....	180.99	180.99
Burial of indigent soldiers.....	1,600.00	.....	1,600.00	310.00	1,290.00	1,600.00
Headstones for graves of soldiers.....	19,907.75	521.79	20,429.54	10,240.00	74.52	20,429.54
Road to national cemetery, Presidio of San Francisco, Cal.....	.....	1.80	1.80	.....	.....	1.80
Sewerage system, Fortress Monroe, Va.....	.....	387.01	387.01	.....	.....	387.01
Antietam battlefield preservation.....	.....	22	22	.....	.....	22
Total.....	17,041,617.43	3,638,491.91	20,680,109.34	656,828.02	19,993,281.32	20,680,109.34

Financial statement for fiscal year ending June 30, 1901—Continued

Appropriations.	Appropriated.		Placed to credit of appropriations during the year, being the proceeds of sales to officers, etc.	Total to be accounted for.	Remitted to disbursing officers.	Paid on settlements made at Treasury claims and accounts.	Amounts charged against appropriations by Treasury transfer warrants.	Amounts carried to surplus fund act June 20, 1874.	Balance in Treasury undrawn June 30, 1901, and available for outstanding obligations.	Total accounted for.
	Amount.	Date of act.								
<i>1900 and 1901.</i>				\$100,000.00	\$100,000.00					\$100,000.00
Military roads and bridges, Alaska.....										
<i>1901.</i>										
Regular supplies.....	\$8,264,000.00	May 26, 1900	\$886,568.47	10,150,568.47	6,054,528.83	\$1,386.92			\$4,094,042.72	10,150,568.47
Incidental expenses.....	2,400,000.00	.....do.....	53,768.01	750,000.00	3,203,768.01	2,382,412.20			848,109.08	3,203,768.01
Horses for cavalry and artillery.....	750,000.00	.....do.....	7,808.93	500,000.00	1,257,808.93	972,039.30	236.12		285,543.51	1,257,808.93
Barracks and quarters.....	3,000,000.00	.....do.....	60,880.01		3,060,880.01	1,967,549.98	236.62		1,073,093.56	3,060,880.01
Transportation of the Army and its supplies.....	29,900,000.00	.....do.....	1,287,677.01	8,350,000.00	39,637,677.01	28,745,427.76	76,225.99		10,716,023.26	39,637,677.01
Clothing and camp and garrison equipage.....	8,500,000.00	.....do.....	951,479.53	1,500,000.00	10,951,479.53	883,846.25	7,596.61		1,560,036.67	10,951,479.53
Construction and repair of hospitals.....	250,000.00	.....do.....	11,866.80		261,866.80	204,111.39			57,755.41	261,866.80
National cemeteries.....	100,000.00	June 6, 1900	844.63		100,844.63	98,680.20			2,164.43	100,844.63
Pay of superintendents of national cemeteries.....	61,880.00	.....do.....	60.00		61,940.00	61,765.84			174.16	61,940.00
Shooting galleries and ranges.....	10,000.00	May 26, 1900	885.49		10,885.49	10,825.49			60.00	10,885.49
Quarters for hospital stewards.....	20,000.00	.....do.....	235.53		20,235.53	20,136.83			98.70	20,235.53
Military posts.....	1,000,000.00	June 6, 1900	7,060.00		1,007,060.00	831,574.88			675,475.17	1,007,060.00
Repairing roads to national cemeteries.....	15,000.00	.....do.....			15,000.00	13,179.38			1,820.62	15,000.00
Burial of indigent soldiers.....	3,000.00	.....do.....			3,000.00	1,900.00			1,100.00	3,000.00
Headstones for graves of soldiers.....	25,000.00	.....do.....			25,000.00	7,445.50	.88		17,554.12	25,000.00
Road to national cemetery, Presidio of San Francisco, Cal.....	5,000.00	.....do.....	4,854.21		9,854.21	9,854.21				9,854.21
Swing system, Fortress Monroe, Va.....	7,222.00do.....			7,222.00	7,222.00				7,222.00

QUARTERMASTER-GENERAL.

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Financial statement for fiscal year ending June 30, 1901—Continued.

Appropriations.	Balance in Treasury undrawn July 1, 1900.	Appropriated.		Placed to credit of appropriations during the year, being the proceeds of sales of officers, etc.	Placed to credit of appropriations during the year by Treasury transfer warrants.	Total to be accounted for.	Remitted to disbursing officers.	Paid on settlements made at Treasury and accounts.	Amounts charged against appropriations by Treasury transfer warrants.	Amounts carried to surplus fund act June 20, 1874.	Balance in Treasury undrawn June 30, 1901, and available for outstanding obligations.	Total accounted for.
		Amount.	Date of act.									
<i>Indefinite or special—C'td.</i>												
Garrison quarters, Sullivan Island, South Carolina.....	\$135,000.00					\$135,000.00	\$135,000.00					\$135,000.00
Bringing home remains of civil employees of the Army who die abroad and soldiers who die on transports.....	99,500.00					99,538.64	3,500.00	\$37.78			\$96,015.86	99,538.64
Suppressing hostilities of the Puute Indians in Nevada in 1890.....	2,501.00				\$83.64	2,501.00					2,501.00	2,501.00
Miscellaneous advertising, War Department.....	319.15					319.15	314.15				5.00	319.15
Road to national cemetery, Illinois.....		\$12,000.00	June 6, 1900	2.32		12,002.32	9,381.43				2,640.89	12,002.32
Report upon claims for private property taken in the military service, war with Spain.....		10,000.00	do	142.50		10,142.50	887.19				9,255.31	10,142.50
Schuylkill Arsenal, Philadelphia, Pa.....		22,000.00	do			22,000.00	22,000.00					22,000.00
Army building, Omaha, Nebr.....				342.68		342.68	342.68					342.68
Military post, Des Moines, Iowa.....		200,000.00	Mar. 3, 1901			200,000.00					200,000.00	200,000.00
Subsistence of prisoners, Nagasaki, Japan, to San Francisco, Cal.....		66.00	do			66.00	66.00					66.00
Transportation of merchandise to Apache prisoners of war.....		16.63	do			16.63	16.63					16.63
Transportation of destitute miners from Alaska.....		920.00	do			920.00					920.00	920.00

Belief of Oliver M. Blair, administrator of Thomas P. Blair.....	32,000.00	May 29, 1900	32,000.00	32,000.00	32,000.00	32,000.00
Belief of Leonard Wilson.....	642.68	Mar. 2, 1901	642.68	642.68	642.68	642.68
Belief of E. B. Croder, executor of Dr. C. W. Croster.....	195.00	June 6, 1900	195.00	195.00	195.00	195.00
Belief of trustees of Holston Seminary, Newmarket, Tenn.....	3,000.00	Mar. 2, 1901	3,000.00	3,000.00	3,000.00	3,000.00
Belief of Lewis M. Millard.....	241.00	Feb. 26, 1901	241.00	241.00	241.00	241.00
Total.....	465,145.19	381,081.31	51,116.42	\$100,000.00	997,342.92	997,342.92
<i>Pacific roads.</i>						
1898 and prior years.....			111.01	111.01	111.01	111.01
1899.....			261,545.01	261,545.01	261,545.01	261,545.01
1900.....			362,617.66	362,617.66	362,617.66	362,617.66
1901.....			2,577.53	2,577.53	2,577.53	2,577.53
Total.....			625,851.21	625,851.21	625,851.21	625,851.21
Transportation of volunteers, war with Spain.....						
Reimbursement for bringing home remains of officers and others, Army.....			1,657.06	1,657.06	1,657.06	1,657.06
Grand total.....	35,962,893.60	54,699,488.41	7,767,798.50	13,329,309.35	111,759,499.86	111,759,499.86

NOTE.—Of the \$200,000 appropriated by act of December 18, 1897, for "Relief of people in mining regions of Alaska," there has been charged against the same on the books of this office during the fiscal year 1901 the sum of \$2,597.18. Of the \$300,000 appropriated by act of March 9, 1898, for "National defense," there has been charged against the same on the books of this office during the fiscal year 1901 the sum of \$277.21.

The records of this office show the following amounts remitted from regular and from indefinite or special appropriations:

Remitted from regular appropriations, fiscal year 1901.

Departments, etc.	Regular supplies.	Incidental expenses.	Horses for cavalry and artillery.	Barracks and quarters.	Transportation of the Army and its supplies.
Department of Alaska.....	\$54,000.00	\$37,249.67	.....	\$221,393.50	\$296,894.00
Department of California.....	319,190.50	98,552.65	\$176,487.67	115,616.45	351,850.12
Department of Colorado.....	202,513.63	55,474.25	40,159.30	56,835.58	341,689.74
Department of Columbia.....	469,233.84	62,326.71	301,500.00	51,232.75	542,055.23
Department of Dakota.....	191,266.01	50,179.60	47,984.00	40,574.35	149,742.41
Department of the East.....	219,253.65	151,643.98	.....	257,964.98	482,997.42
Department of Missouri.....	318,443.75	78,286.28	8,136.60	95,739.87	388,708.75
Department of the Lakes.....	133,436.64	91,021.67	133,080.25	79,536.12	349,346.33
Department of Texas.....	84,546.13	29,861.74	119,228.68	45,552.65	139,100.00
Depot at New York.....	4,023,040.83	158,722.72	7,000.00	127,759.35	1,078,243.96
Depot at Philadelphia.....	22,460.06	84,220.85	.....	56,479.55	1,041,618.40
Depot at Washington.....	392,000.00	512,000.00	130,043.00	344,500.00	5,620,000.00
Depot at Jeffersonville.....	290,637.16	92,570.67	.....	19,244.06	622,869.38
Depot at St. Louis.....	10,087.81	28,817.87	8,419.80	14,522.29	164,347.42
Depot at San Francisco.....	815,845.59	164,097.79	.....	76,188.61	2,179,790.28
West Point, N. Y.....	61,469.46	12,284.84	.....	53,287.80	7,612.30
Fort Totten, N. Y.....	1,294.03	1,246.39	.....	2,268.40	1,624.00
Springfield Armory.....	1,413.95	335.00	.....	.....	.....
New Orleans, La.....	36,453.46	7,552.32	.....	2,378.38	21,391.99
Hot Springs, Ark.....	11,483.99	3,876.14	.....	680.00	8,627.63
Fort Wright, Wash.....	220.93	142.00	.....	.....	490.00
Seattle, Wash.....	855,869.55	22,603.09	.....	107,750.06	3,020,235.52
Fort Ethan Allen, Vt.....	.....	483.34	.....	.....	157.50
Army transport service, New York	6,000.00	84,040.27	.....	5,153.50	2,002,360.76
Army transport service, San Francisco	208,534.12	114,242.26	.....	35,931.00	7,209,324.27
Delaware City, Del.....	1,728.33	3,318.33	.....	6,419.00	25,600.70
Fort Washington, Md., and Hunt, Va.....	15,538.03	2,133.00	.....	15,736.24	12,185.62
Fort Leavenworth, Kans.....	2,034.00	6,638.92	.....	4,957.40	6,157.80
Fort Morgan, Ala.....	117.70	3,193.52	.....	8,009.45	2,565.77
Fort Stevens, Ore.....	4,597.25	8,259.96	.....	11,876.31	30,618.30
Baltimore depot.....	971.52	3,256.71	.....	3,678.50	33,534.74
Galveston, Tex.....	484.50	3,514.72	.....	318.02	3,696.00
Lytile, Ga.....	1,152.84	6,396.34	.....	.....	7,821.00
Newport, R. I.....	3,926.33	5,049.81	.....	17,157.50	31,472.74
St. Asaph, Va.....	1,779.05	19,656.68	.....	2,731.70	36,011.20
Josiah Simpson Hospital, Fortress Monroe.....	235.72	1,417.50	.....	291.62	929.16
Department of Cuba.....	111,000.00	213,187.00	.....	.....	1,133,869.33
Department of Porto Rico.....	24,147.90	32,033.30	.....	76,293.77	213,247.00
Manila, P. I.....	50,000.00	75,000.00	.....	.....	350,000.00
Nagasaki, Japan.....	18,000.00	21,000.00	.....	3,400.00	760,000.00
China.....	20,000.00	15,000.00	.....	15,000.00	50,000.00
Honolulu, H. I.....	775.00	3,264.45	.....	3,662.01	21,000.00
Sheridan, Wyo.....	82.55	2,426.66	.....	129.98	492.50
Fort Bayard, N. Mex.....	.....	.....	.....	7,176.69	.....
Columbus Barracks, Ohio.....	.....	190.00	.....	122.89	10.00
Allegheny Arsenal.....	665.80	.....	.....	.....	67.00
Augusta Arsenal.....	769.00	185.00	.....	.....	900.00
Benicia Arsenal.....	976.60	109.20	.....	.....	.....
Columbia Arsenal.....	1,051.30	1.00	.....	.....	100.00
Frankford Arsenal.....	248.14	35.00	.....	.....	1,782.03
Indianapolis Arsenal.....	610.68	.....	.....	.....	.....
Kenebec Arsenal.....	867.69	.....	.....	.....	.....
Rock Island Arsenal.....	1,609.05	241.64	.....	.....	836.85
Watervliet Arsenal.....	457.89	331.19	.....	.....	392.33
Watertown Arsenal.....	2,062.86	240.17	.....	.....	862.28
Fort Monroe, Va.....	.....	.....	.....	.....	.....
Total.....	6,054,528.83	2,352,412.20	972,039.30	1,987,549.93	28,745,427.76

Remitted from regular appropriations, fiscal year 1901—Continued.

Departments, etc.	Clothing and camp and garrison equipage.	National cemeteries.	Pay of superintendents of national cemeteries.	Construction and repair of hospitals.	Shooting galleries and ranges.
Department of Alaska.....	\$1,000.00				
Department of California.....	16,804.80	\$58.20		\$3,248.79	\$1,129.86
Department of Colorado.....	340.00			10,879.57	423.97
Department of Columbia.....	1,012.54			1,385.62	270.80
Department of Dakota.....	1,514.04			9,054.48	1,739.51
Department of the East.....	1,031,856.11			44,971.00	2,511.57
Department of Missouri.....	1,120.39			30,149.58	3,689.78
Department of the Lakes.....	663,681.02	33.00		2,645.24	365.00
Department of Texas.....	516.85			8,072.76	325.00
Depot at New York.....	1,676,031.86	3,192.19	\$900.00	213.90	110.00
Depot at Philadelphia.....	4,157,179.50	5,245.42	2,240.00		
Depot at Washington.....	46,500.00	39,603.90	21,899.50	8,132.30	
Depot at Jeffersonville.....	302,660.11	4,314.45	3,786.00		
Depot at St. Louis.....	16,399.57	12,318.41	10,620.34	42.14	
Depot at San Francisco.....	1,413,302.06	5,735.80	780.00		
West Point, N. Y.....	137.00				
Fort Totten, N. Y.....	51.90			589.34	
New Orleans, La.....		27,907.73	21,540.00		
Hot Springs, Ark.....				59,028.00	
Seattle, Wash.....	1,622.85				
Army transport service, New York	2,000.00				
Army transport service, San Francisco					
Fort Washington, Md., and Hunt, Va.....	35,000.00				
Galveston, Tex.....	769.60			16,180.41	
Newport, R. I.....				2,127.72	
St. Asaph, Va.....	3,385.00				
Department of Cuba.....	9,630.00				
Department of Porto Rico.....	1,300.00			2,890.54	260.00
Rock Island Arsenal.....	13.75	231.10			
Watertown Arsenal.....	700.00				
Total.....	9,383,846.25	98,680.20	61,765.84	304,111.89	10,825.49

Departments, etc.	Quarters for hospital stewards.	Headstones for graves of soldiers.	Military posts.	Repairing roads to national cemeteries.	Burial of indigent soldiers.
Department of California.....	\$67.11		\$10,302.18		
Department of Colorado.....	1,101.87		46,505.00		
Department of Columbia.....	396.60				
Department of Dakota.....	1,492.91		73,402.78		
Department of the East.....	13,861.85	\$6,855.00	108,705.89		
Department of Missouri.....	1,619.33				
Department of the Lakes.....	524.89	10.50			
Department of Texas.....	841.27				
Depot at Washington.....	98.70	550.00		\$6,262.17	\$1,900.00
Depot at St. Louis.....		30.00		542.85	
Fort Totten, N. Y.....	77.30		6,950.00		
New Orleans, La.....				6,374.36	
Hot Springs, Ark.....	55.00				
Delaware City, Del.....			20,004.22		
Fort Washington, Md., and Hunt, Va.....					
Fort Leavenworth, Kans.....			12,867.00		
Fort Morgan, Ala.....			7,619.00		
Fort Stevens, Oreg.....			4,146.25		
Baltimore depot.....			21,568.60		
Newport, R. I.....			1,280.00		
			18,223.91		
Total.....	20,136.83	7,445.50	331,574.83	13,179.38	1,900.00

Remitted from regular appropriations, fiscal year 1901—Continued.

Departments, etc.	Road to national cemetery, Presidio of San Francisco, Cal.	Improving Oak Hill Cemetery, Evansville, Ind.	Reburial of Confederate soldiers at National Cemetery, Arlington.	Antietam battlefield preservation.	Sewerage system, Fortress Monroe, Va.	Total.
Department of Alaska.....						\$610,537.17
Department of California.....						1,098,248.33
Department of Colorado.....						1,816,101.91
Department of Columbia.....						1,419,414.09
Department of Dakota.....						566,950.09
Department of the East.....						2,320,621.45
Department of Missouri.....						925,893.33
Department of the Lakes.....						1,453,690.66
Department of Texas.....						429,045.08
Depot at New York.....						4,075,214.81
Depot at Philadelphia.....						5,369,484.08
Depot at Washington.....			\$2,500.00	\$2,700.00		7,128,689.57
Depot at Jeffersonville.....		\$615.00				1,336,696.83
Depot at St. Louis.....						265,648.50
Depot at San Francisco.....	\$9,854.21					4,665,594.34
West Point, N. Y.....						134,791.40
Fort Totten, N. Y.....						14,101.36
Springfield Armory.....						1,748.96
New Orleans, La.....						123,508.24
Hot Springs, Ark.....						83,750.76
Fort Wright, Wash.....						852.93
Seattle, Wash.....						4,008,081.07
Fort Ethan Allen, Vt.....						640.84
Army transport service, New York						2,099,554.53
Army transport service, San Francisco						7,603,032.25
Delaware City, Del.....						57,070.58
Fort Washington, Md., and Hunt, Va.....						74,640.30
Fort Leavenworth, Kans.....						27,411.12
Fort Morgan, Ala.....						18,052.69
Fort Stevens, Oreg.....						71,920.42
Baltimore depot.....						42,721.47
Galveston, Tex.....						8,781.84
Lytle, Ga.....						15,370.18
Newport, R. I.....						77,958.01
St. Asaph, Va.....						63,573.63
Josiah Simpson Hospital, Fortress Monroe.....						2,874.00
Department of Cuba.....						1,467,696.33
Department of Porto Rico.....						349,672.51
Manila, P. I.....						475,000.00
Nagasaki, Japan.....						802,400.00
China.....						100,000.00
Honolulu, H. I.....						28,701.46
Sheridan, Wyo.....						3,131.69
Fort Bayard, N. Mex.....						7,176.69
Columbus Barracks, Ohio.....						322.89
Allegheny Arsenal.....						732.80
Augusta Arsenal.....						1,854.00
Benicia Arsenal.....						1,085.80
Columbia Arsenal.....						1,152.30
Frankford Arsenal.....						2,065.17
Indianapolis Arsenal.....						610.68
Kennebec Arsenal.....						867.69
Rock Island Arsenal.....						2,932.40
Watervliet Arsenal.....						1,181.41
Watertown Arsenal.....						3,172.31
Fort Monroe, Va.....					\$7,222.00	7,222.00
Total.....	9,854.21	615.00	2,500.00	2,700.00	7,222.00	50,268,314.94

Remitted from indefinite or special appropriations during the fiscal year 1901.

Departments, etc.	Bringing home the remains of officers and soldiers who die abroad.	Road from Newbern to the National Cemetery, North Carolina.	Military post, Sheridan, Wyo.	Garrison quarters, Sullivan's Island, S. C.	Bringing home remains of civil employees of the Army who die abroad and soldiers who die on transports.	Miscellaneous advertising, War Department.
Department of California.....	\$1,059.00					
Department of Colorado.....			\$89,522.00			
Department of Lakes.....	303.00					
Department of Cuba.....	4,000.00					
Depot at Washington.....	42,000.00	\$6,000.00			\$3,500.00	\$314.15
Depot at San Francisco.....	200,240.13					
Sheridan, Wyo.....			10,061.00			
Sullivan's Island, S. C.....				\$135,000.00		
Total.....	247,602.13	6,000.00	99,583.00	135,000.00	3,500.00	314.15

	Road to National Cemetery, Illinois.	Report upon claims for private property taken in the military service, war with Spain.	Schuylkill Arsenal, Philadelphia, Pa.	Army building, Omaha, Nebr.	Subsistence of prisoners, Nagasaki, Japan, to San Francisco, Cal.	Transportation of merchandise to Apache prisoners of war.	Total.
Department of California.....							\$1,059.00
Department of Colorado.....							\$89,522.00
Department of Missouri.....				\$342.68			342.68
Department of Lakes.....						\$16.63	319.63
Department of Cuba.....							4,000.00
Depot at Philadelphia.....			\$22,000.00				22,000.00
Depot at Washington.....							51,814.15
Depot at San Francisco.....							200,240.13
Depot at St. Louis.....	\$9,361.43						9,361.43
Army transport service, San Francisco.....					\$66.00		66.00
Spanish War Claims Board.....		\$87.19					87.19
Sheridan, Wyo.....							10,061.00
Sullivan's Island, S. C.....							135,000.00
Total.....	9,361.43	87.19	22,000.00	342.68	66.00	16.63	524,673.21

MONEY ACCOUNTS.

The assignment of work under this head consists of the administrative examination of the money accounts of officers serving in the Quartermaster's Department before their transmission to the Auditor for the War Department.

The following is a statement showing the number of accounts received, examined, and forwarded to the Auditor during the fiscal year ending June 30, 1901:

Received during the year ending June 30, 1901..... 7,246
Forwarded to the Auditor for the War Department during the year ending June 30, 1901..... 6,932

This is about 24 per cent more than the number of money accounts received and examined during the previous fiscal year.

RETURNS OF QUARTERMASTER'S SUPPLIES.

The duties in this branch are the examination of returns of quartermaster's supplies for the use of the Army and the militia of the several

States and Territories, and correspondence pertaining thereto. Preliminary action is also taken on report of boards of survey and inspection reports from quartermaster's depots and independent posts, and on reports referred for special action.

The following table shows the number of returns received, examined, and on hand, and letters written, viz:

Returns on hand June 30, 1900	10
Returns received during fiscal year 1901	4,551
Returns examined during fiscal year 1901	4,172
Returns on hand June 30, 1901	389
Annual returns (militia) examined	39
Letters written	13,348

This is 762 more returns received and 317 less letters written than last year.

There were 16 regular and 14 temporary clerks in this branch June 30, 1901, being 2 less than on June 30, 1900.

MAIL AND RECORD DIVISION.

The following communications were received and letters and indorsements mailed during the fiscal year:

Original cases	14,503
Received back	112,456
Letters and indorsements mailed	111,723

MISCELLANEOUS CLAIMS AND ACCOUNTS.

There remained on hand at the beginning of the fiscal year awaiting action—

48 miscellaneous claims, amounting to	\$12,664.05
232 accounts, amounting to	20,252.19

There were received during the fiscal year—

196 miscellaneous claims, amounting to	127,207.64
691 accounts, amounting to	66,368.12

Total, 1,167 claims and accounts, amounting to

226,592.00

Final action was taken on these as follows:

12 claims were approved for payment	\$1,203.38
29 claims were referred to other departments	9,711.02
87 claims were sent to the Treasury Department for settlement	102,580.84
70 claims were rejected	12,089.27
Reduction on claims referred	1,009.43
460 accounts were approved for payment	42,046.90
Reduction on accounts approved	928.02
193 accounts were referred to other departments	8,485.02
54 accounts were rejected, amounting to	3,068.59

Total upon which final action was taken, 198 claims and 707 accounts, amounting to

181,122.47

On July 1, 1901, there were on hand awaiting action—

46 claims, amounting to	\$13,277.75
216 accounts, amounting to	32,191.78

Total, 262 claims and accounts

45,469.53

CLAIMS UNDER THE ACT OF JULY 4, 1864.

There remained in this office July 1, 1901, not finally acted upon 94 claims presented under the act of July 4, 1864, amounting to \$119,104.12. Action upon these claims has been suspended awaiting additional evidence.

The papers pertaining to 30 claims, amounting to \$45,843.26, which had previously been investigated and disallowed by the Quartermaster-General, were during the year transmitted to the Court of Claims for use as evidence in such cases as had been appealed to the Court of Claims under provision of the law of March 3, 1883, known as the Bowman Act.

NEWSPAPERS AND PERIODICALS.

During the fiscal year newspapers and periodicals have been supplied for the enlisted men in the Army stationed within the States, in Cuba, Porto Rico, and in China, at 170 military post libraries, at posts garrisoned by 226 companies and detachments, at a cost of \$3,731.06, and to the enlisted men in the Philippines, at a cost of \$2,153.

PRINTING AND BINDING.

During the fiscal year 187 requisitions were made on the Public Printer for printing and binding.

The cost of the work, so far as bills have been received, is \$15,543.20, which sum does not include the cost of work done in the War Department branch printing office.

NATIONAL CEMETERIES, 1900-1901.

The national cemeteries are classed as follows:

First class.....	25
Second class.....	20
Third class.....	16
Fourth class.....	22
Total	83

The interments therein to June 30, 1901, were:

Known	192, 683
Unknown.....	151, 680
Total	344, 363

Being an increase of 2,121 interments during the year, of which number 377, including remains of officers and soldiers from abroad, were interred in the Arlington, Va., and 855 in the San Francisco, Cal., national cemeteries.

There are 75 superintendents of national cemeteries authorized by law. Of these, 71 were in service at the commencement of the year. Changes during the year were as follows: Appointed, 5, and 1 granted leave of absence without pay, with the understanding that he would resume his duties when a vacancy occurred, subsequent to the close of the fiscal year, leaving the full number authorized by law on duty at the close of the year. There were also three assistant superintendents

serving probationary terms pending permanent appointments, and one who has satisfactorily completed his probationary service and is awaiting an opportunity for appointment when a vacancy occurs.

REMOVAL OF REMAINS FROM PLACES WITHIN UNITED STATES.

Removals of remains of officers and enlisted men from abandoned post cemeteries, and other places within the United States, to permanent post or national cemeteries, were made as follows:

From—	To—	Num- ber.
Fort Hill Burial Ground, Macon, Ga.	Andersonville, Ga., National Cemetery	2
Cheyenne and Arapahoe Agency, Okla.	Springfield, Mo., National Cemetery	4
County poorhouse, Richmond, Va.	Richmond, Va., National Cemetery	1
Fort Sherman, Idaho	Post cemetery, Fort Wright, Wash.	46
Fort Hunt, Va.	Arlington, Va., National Cemetery	2
Ellisville, Miss.	Chalmette, La., National Cemetery	3
Union, Newton County, Miss.	Vicksburg, Miss., National Cemetery	2
Crisfield, Kans.	Fort Leavenworth, Kans., National Cemetery ..	1
Fort Crockett, Galveston, Tex.	San Antonio, Tex., National Cemetery	1
Jackson, Miss.	Vicksburg, Miss., National Cemetery	38
Total.....		100

Under the act of Congress (sundry civil) approved June 6, 1900, appropriating the sum of \$2,500 "To enable the Secretary of War to have reburied in some suitable spot in the national cemetery at Arlington, Va., and place proper headstones at their graves, the bodies of about one hundred and twenty-eight Confederate soldiers now buried in the National Soldiers' Home, District of Columbia, and the bodies of about one hundred and thirty-six Confederate soldiers now buried in the national cemetery at Arlington, Virginia," the remains of 264 such soldiers were transferred to an appropriate section selected for that purpose at an expenditure of \$1,962.65. The work of grading and constructing the necessary drives and walks in the section is now in progress.

HEADSTONES.

Five thousand three hundred and twenty-eight white marble headstones were provided to mark the graves of known Union soldiers, sailors, and marines, in national, post, city, and village cemeteries.

INDIGENT SOLDIERS.

Under the acts of Congress (sundry civil) making appropriations for "Expenses of burying in the Arlington National Cemetery, or in the cemeteries of the District of Columbia, indigent ex-Union soldiers, sailors, and marines of the late civil war who die in the District of Columbia," claims for the burial of 57 such persons have been paid, at a total cost of \$2,259.

ANTIETAM BATTLEFIELD.

Under the appropriation, \$1,500 (sundry civil), approved June 6, 1900, "For repairs and preservation of the monuments, tablets, observation tower, roads, fences, etc., made and constructed by the United States upon public land within the limits of the Antietam battlefield, near

Sharpsburg, Md.," several of the avenues have been resurfaced and cleaned, the tablets painted, and the bridges repaired, at an expenditure of \$1,499.97.

ROADWAYS.

Under the act of Congress approved May 14, 1900, appropriating the sum of \$6,000 "For much-needed repairs and improvements of the graveled or macadamized road leading from the city of Newbern, N. C., to the national cemetery near said city," the work is now in progress under contract and will be completed at an early date. Amount expended during the fiscal year, \$3,929.21.

MOUND CITY, ILL.

Cache River Branch.—Under the act of Congress approved June 4, 1900, appropriating the sum of \$12,000 "For permanently repairing the Government roadway from Cache River Bridge, in Pulaski County, Ill., to the graveled roadway extending from Mound City, Ill., to the national cemetery near that city," the work is progressing satisfactorily under contract.

Amount expended under the contract during the fiscal year.....	\$1, 256. 40
Expended for engineering, superintendence, etc.....	668. 93
Total expended	1, 925. 33

Under the act of Congress (sundry civil) approved June 6, 1900, making appropriation "For repairs to roadways to national cemeteries which have been constructed by special authority of Congress," necessary repairs have been made to the roadways to the national cemeteries at Alexandria, La.; Alexandria, Va.; Antietam, Md.; Baton Rouge, La.; Beverly, N. J.; Chalmette, La.; Chattanooga, Tenn.; Culpeper, Va.; Florence, S. C.; Fayetteville, Ark.; Fredericksburg, Va.; Marietta, Ga.; Mound City, Ill.; Natchez, Miss.; Port Hudson, La.; Richmond, Va.; Springfield, Mo.; Staunton, Va.; and Vicksburg, Miss. Amount expended, \$13,156.32.

MEMORIAL DAY.

May 30, appropriate services were conducted at the several national cemeteries by the Grand Army of the Republic and military and other organizations. Good order generally prevailed.

IMPROVEMENTS AND REPAIRS OF NATIONAL CEMETERIES.

At the Antietam, Md., National Cemetery a brick stable was erected in the adjoining lot on the western side of cemetery and a gateway leading thereto opened in the inclosing wall. Necessary repairs were made and the grounds kept in good order.

At the Arlington, Va., National Cemetery repairs were made to the mansion, outbuildings, water supply, and drainage, and the drives and walks kept in order. A new gateway opened in the western wall as an entrance to the southern portion of the cemetery in the vicinity of the Confederate section, the new grounds surveyed and cleared of brush and undergrowth, and a new burial section—"Southern division of the officers' burial section"—laid out and prepared for interments.

At the Balls Bluff, Va., National Cemetery a flagstaff 50 feet in height was erected and a contract awarded for rebuilding the inclosing wall. The work is now in progress, to be completed at an early date.

At the Battle Ground, D. C., National Cemetery necessary repairs were made to the lodge, outbuilding, and water supply, and the grounds kept in order. The work of removing and setting back the front inclosing wall on Brightwood avenue, for which a contract was made during the previous fiscal year, was completed.

At the Camp Nelson, Ky., National Cemetery necessary repairs were made and an ornamental iron drive and walk gate provided, under contract, to close the entrance to the lane leading from the public highway to the cemetery.

At the Culpeper, Va., National Cemetery repairs were made to the lodge, outbuilding, and water supply.

At the Cypress Hills, N. Y., National Cemetery necessary repairs were made to the lodge, the flagstaffs painted, the water supply repaired and extended, and a brick addition made to the outbuilding.

At the Fayetteville, Ark., National Cemetery necessary repairs were made to the lodge and outbuilding, a new cistern constructed, and a wooden flagstaff 75 feet in height erected.

At the Fort Harrison, Va., National Cemetery necessary repairs were made to the lodge, drainage, and flagstaff, and a new frame privy constructed for public use.

At the Fort Leavenworth, Kans., National Cemetery necessary repairs were made and the grounds kept in good order.

At the Fredericksburg, Va., National Cemetery repairs were made to the inclosing wall, lodge, outbuilding, water supply, and drainage.

At the Hampton, Va., National Cemetery repairs were made to the lodge, outbuilding, and drainage, and the flagstaff painted.

At the Jefferson Barracks, Mo., National Cemetery the lodge, rostrum, water supply, and drainage were repaired, and the grounds kept in good order.

At the Keokuk, Iowa, National Cemetery the lodge was thoroughly repaired and painted, and a new wooden flagstaff 75 feet in height erected.

At the Lebanon, Ky., National Cemetery necessary repairs were made to the lodge and brick outbuilding and a new well house erected.

At the Little Rock, Ark., National Cemetery a new brick stable and a brick privy were erected and necessary repairs made to the inclosing wall and drainage.

At the Mexico City, Mexico, National Cemetery necessary repairs were made to the inclosing wall, lodge, and water supply, and the grounds kept in order.

At the Mill Springs, Ky., National Cemetery the lodge and outbuildings were repaired and a new frame privy erected.

At the Nashville, Tenn., National Cemetery necessary repairs were made, the grounds kept in good condition, and new well house constructed.

At the New Albany, Ind., National Cemetery the trellis roof of rostrum was renewed and necessary repairs made to the outbuilding and drainage.

At the Philadelphia, Pa., National Cemetery extensive repairs were made to the lodge and outbuilding, a new wooden flagstaff 100 feet in height erected, and a contract awarded for improvement of the drives, walks, and drainage. The work is now in progress.

At the Raleigh, N. C., National Cemetery a contract was authorized for the erection of a new wooden flagstaff 75 feet in height, to replace the old staff, reported as unserviceable.

At the Richmond, Va., National Cemetery necessary repairs were made to the lodge and water supply, the grounds kept in good condition, and a new frame privy erected for public use.

At the San Francisco, Cal., National Cemetery necessary repairs were made to the lodge, fencing, and flagstaff, and the well, pump, and windmill supplying water to cemetery put in order. The original burial sections having become nearly filled, and, in view of the large number of remains of soldiers being received from the Philippine Islands, an additional strip of land, 130 feet in width by 670 feet in length, on the western side of the cemetery, sufficient for approximately 1,400 graves, was cleared, graded, and prepared, under contract, for interments. The roads and walks within this cemetery and also the road leading from the Fort Point road to the cemetery entrance were repaired and the grounds kept in order. A temporary stand was erected for use of the speakers on Memorial Day, and appropriate ceremonies were observed by the troops at the Presidio, the G. A. R., members of the Regular Army and Navy Union, and citizens. During the year 6 monuments, 1 granite shaft, and 14 other memorial headstones were erected by friends to mark the graves of deceased officers and soldiers.

At the Winchester, Va., National Cemetery a part of the inclosing wall (approximately 367 feet in length) was rebuilt, and the lodge, outbuilding, and water supply repaired.

At the Yorktown, Va., National Cemetery necessary repairs were made to the gates, lodge, outbuilding, flagstaff, and water supply, and the grounds properly cared for.

At all other national cemeteries necessary repairs were made, and the grounds, walks, and drives kept in good order.

A statement marked A, showing the expenditures on account of the several national cemeteries during the fiscal year, is submitted herewith:

A.—Statement of disbursements of appropriations for national cemeteries during the fiscal year ending June 30, 1901.

Name of cemetery.	Amount.	Name of cemetery.	Amount.
Alexandria, La.....	\$424.63	Danville, Ky.....	\$271.75
Alexandria, Va.....	616.49	Danville, Va.....	288.40
Andersonville, Ga.....	1,368.78	Fayetteville, Ark.....	1,057.77
Annapolis, Md.....	483.05	Finns Point, N. J.....	338.10
Antietam, Md.....	1,771.65	Florence, S. C.....	295.88
Arlington, Va.....	18,510.76	Fort Donelson, Tenn.....	426.04
Balls Bluff, Va.....	274.50	Fort Gibson, Ind. T.....	431.33
Barrancas, Fla.....	865.70	Fort Harrison, Va.....	481.10
Baton Rouge, La.....	1,075.03	Fort Leavenworth, Kans.....	1,254.32
Battle Ground, D. C.....	1,358.57	Fort McPherson, Nebr.....	192.72
Beaufort, S. C.....	1,026.64	Fort Scott, Kans.....	416.62
Beverly, N. J.....	413.20	Fort Smith, Ark.....	591.43
Brownsville, Tex.....	804.35	Fredericksburg, Va.....	1,312.29
Camp Butler, Ill.....	450.39	Gettysburg, Pa.....	739.17
Camp Nelson, Ky.....	1,327.31	Glendale, Va.....	150.70
Cave Hill, Ky.....	258.41	Grafton, W. Va.....	285.38
Chalmette, La.....	1,284.50	Hampton, Va.....	1,526.56
Chattanooga, Tenn.....	3,403.18	Jefferson Barracks, Mo.....	2,182.71
City Point, Va.....	628.13	Jefferson City, Mo.....	191.81
Cold Harbor, Va.....	519.25	Keokuk, Iowa.....	965.20
Corinth, Miss.....	1,291.79	Knoxville, Tenn.....	442.59
Crown Hill, Ind.....	100.00	Lebanon, Ky.....	488.35
Calpeper, Va.....	549.18	Lexington, Ky.....	60.00
Custer Battlefield, Mont.....	545.73	Little Rock, Ark.....	2,681.64
Cypress Hills, N. Y.....	2,693.27	Loudon Park, Md.....	722.75

A.—Statement of disbursements of appropriations for national cemeteries, etc.—Continued.

Name of cemetery.	Amount.	Name of cemetery.	Amount.
Marietta, Ga.	\$1,384.36	San Francisco, Cal.	\$4,998.38
Memphis, Tenn.	1,552.57	Santa Fe, N. Mex.	989.31
Mexico City, Mexico.	964.45	Seven Pines, Va.	276.92
Mill Springs, Ky.	357.65	Shiloh, Tenn.	637.05
Mobile, Ala.	229.22	Soldiers' Home, D. C.	1,178.91
Mound City, Ill.	961.74	Springfield, Mo.	506.03
Nashville, Tenn.	3,780.28	St. Augustine, Fla.	75.00
Natchez, Miss.	959.17	Staunton, Va.	285.26
New Albany, Ind.	732.10	Stone River, Tenn.	966.13
Newbern, N. C.	434.24	Vicksburg, Miss.	3,175.58
Philadelphia, Pa.	1,661.85	Wilmington, N. C.	296.75
Poplar Grove, Va.	460.22	Winchester, Va.	1,000.43
Port Hudson, La.	488.82	Woodlawn, N. Y.	149.00
Quincy, Ill.	10.05	Yorktown, Va.	491.51
Raleigh, N. C.	405.43	Soldiers' lots.	240.20
Richmond, Va.	1,249.08	Miscellaneous.	3,083.28
Rock Island, Ill.	231.10		
Salisbury, N. C.	515.62	Total.	95,150.70
San Antonio, Tex.	269.98		

The balance of the appropriation (\$100,000) is placed to the credit of officers of the Quartermaster's Department, and is required for the payment of outstanding indebtedness.

REMOVAL OF REMAINS FROM ABROAD.

During the past fiscal year, under authority of the acts of Congress approved July 8, 1898, February 9, May 26, and June 6, 1900, and March 3, 1901, there were received at San Francisco and New York City, as indicated in the recapitulated statement below, 1,825 remains of officers and enlisted men of the Army, Navy, and United States Marine Corps, and civilian employees of the Army, which were disposed of as follows:

Remains arriving at San Francisco and shipped by express at Government expense to relatives or friends for private burial or interment in national cemeteries:

Army officers.	38
Enlisted men, Army.	671
Civilian employees.	27
Navy officers.	2
Enlisted men, Navy.	9
Marines (1 officer).	23

Total remains shipped. 770

Remains arriving at San Francisco and interred in the Presidio National Cemetery at request of relatives or because unclaimed:

Army officers.	3
Enlisted men, Army, 9 unknown.	610
Civilians.	73
Enlisted men, Navy.	8
Marines, 2 unknown.	19

Total remains interred. 713

Held at the general depot of the Quartermaster's Department, San Francisco, awaiting claim by relatives or friends. 172

Total remains received at the port of San Francisco. 1,655

Remains arriving at New York from Cuba and shipped by express at Government expense to relatives or friends for private burial or interment in national cemeteries:

Army officers.	5
Enlisted men.	37
Civilian employees.	10

Remains of Mrs. Martha Allison, widow of late Maj. M. R. Peterson, commissary, U. S. V., shipped at private expense. 1

Total remains shipped. 53

Remains arriving at New York from Cuba and shipped to the Arlington National Cemetery for interment therein:	
Enlisted men, Army, 1 unknown.....	59
Enlisted man, Navy.....	1
Civilian employees, 2 contract nurses.....	57
Total remains interred.....	117
Total remains received at the port of New York.....	170
Grand total remains received from abroad during fiscal year ending June 30, 1901.....	1,825

RECAPITULATION.

Remains received at San Francisco:	
From Philippine Islands.....	1,317
From Hawaiian Islands.....	38
From China.....	138
From Nagasaki, Japan.....	11
From island of Guam.....	7
Died en voyage on army transports.....	144
Total.....	1,655
Remains received at New York:	
From Cuba.....	170
Total remains received at both ports.....	1,825

The amounts which have been remitted by the Quartermaster's Department to the various disbursing officers of the Army during the last fiscal year from appropriations for bringing home remains aggregate the sum of \$251,102.13.

Mr. D. H. Rhodes, by reason of his eminently satisfactory services at the head of the corps of undertakers sent to the Philippines last season, was again chosen to supervise the important and difficult work of disinterment and preparing for shipment to the United States, for burial by relatives or friends or interment in national cemeteries, the remains of such officers and enlisted men of the Army, Navy, and United States Marine Corps, as well as civilian employees of the Army, who had been killed in action or died of disease and were buried there since completion of the operations of the burial party in these islands last year.

Accordingly, with a corps of 15 assistants, Mr. Rhodes left San Francisco, Cal., October 1, 1900, en route to the Philippines. A short stop was made at Honolulu, H. I., for the disinterment of 38 bodies comprising the remains of 33 soldiers, 4 civilians, and 1 marine. Thirty-six of these remains had been left at Honolulu the previous year, the department being unable to bring them home owing to prevalence of the bubonic plague at the time the burial corps visited that point. A second stop was made at Guam, where the remains of 2 of the Navy and 5 enlisted men of the United States Marine Corps, 7 in all, were exhumed and sent to the United States.

Proceeding thence, the burial corps arrived in the Philippines the latter part of October, and after providing themselves with necessary maps and sketches showing the location of cemeteries, burial plots and graves from which the disinterments were to be made, the corps immediately entered upon the laborious and hazardous task which confronted them of exhuming and preparing for shipment 1,375 remains, distributed over an area of more than 125,000 square miles. These remains and the graves from which they were taken had to be thoroughly dis-

infected, the bodies incased in metallic caskets, these hermetically sealed and inclosed in outer boxes packed with sawdust saturated with disinfectants, labeled with name, rank, company, regiment, or character of service and cause of death, and transported to Manila for shipment by army transports to San Francisco. The greatest care was exercised in preserving the identity of the remains, only 9 having been shipped as "unknown," and under specific instructions from this office the reverence and respect due our honored dead were fully observed at all times and under all circumstances when handling them.

To reach the more remote places where remains were buried special expeditions in many instances had to be provided, involving the bringing of transportation—wagons, carts, animals, boats—from distant points, while the personal danger attending the party owing to the activity of the insurgents in some sections often required the taking of a special escort of troops. The many difficulties that had to be overcome, the extensive field of operation, the very limited means of transportation available, the various obstacles intervening to delay progress, such as the unusually heavy rains and excessive heat common to a tropical climate, and the isolated location of many of the bodies (they having to be carried overland a great distance to reach a vessel which in many instances had to "stand by" 1 to 5 miles from shore and was accessible only by small boats), furnish ample explanation of the delay which at times attended the return of soldier dead. The burial corps completed its work in July, 1901, with the exception of a few points on the Cagayan River between Subig Bay and Loag, which, being on the last part of their itinerary, they were unable to reach before the rainy season set in, as also the provinces of Zambales, Union, Ilocos Norte and Ilocos Sur, on the western coast of Luzon, where the prevalence of southwest monsoons rendered it impracticable for a vessel to anchor long enough to receive the remains whose burial places were accessible only from the coast. About 200 bodies were left in these sections, which, however, will be the first to be visited the approaching fall.

Two small burial corps will be permanently established in the Philippines, so that in future it is expected the entire group will be visited annually, or oftener when practicable, and all remains removed and shipped to the United States with the least possible delay after death, thus precluding the necessity of again organizing a burial corps in the United States to visit the Philippines. The arrangement heretofore made for the immediate embalming and shipment of remains when death occurs at places where this may be conveniently done will be continued.

Through the efforts of this office the regulation of the health officers at San Francisco which prevented the landing at that port of bodies where death was caused by variola (or smallpox) was rescinded, and, after correspondence with the military authorities at Manila, the annulment of orders forbidding the exhumation of such remains in the Philippines was also obtained. Unfortunately, however, upon arrival of these remains at San Francisco the express company at that point refused to accept them for the reason that it could not guarantee shipment to destination owing to its inability to obtain the required permit, as in many States the statutes and health regulations absolutely forbid the transportation of bodies when death was due to this disease. As a result of these restrictions the department was com-

pelled to inter in the Presidio National Cemetery at San Francisco 142 of such remains, many of which otherwise would have been sent to their former homes for private burial.

The "Boxer" uprising in China which rendered it necessary for the United States Government to dispatch troops into that country to act in conjunction with those of other nations for the relief of the legationers at Pekin, also imposed upon this department the necessity of sending a small burial party from the Philippines for the disinterment and shipment to the United States of those who died or were killed in that country. Under the supervision of Mr. Solon F. Massey, who happened to be in China at the time and had assisted Mr. Rhodes in previous years, this work was satisfactorily performed and 138 remains were sent home, comprising those of 3 officers of the Army, 98 soldiers, 9 civilian employees, 1 enlisted man and 1 officer (Assistant Paymaster James S. Barber) of the Navy; and 26 marines. A supply of metallic caskets and materials has been left with the officer in command of the United States legation guard at Pekin, and remains will be shipped home in future as soon after death as it may be practicable to do so.

During the fiscal year there were also shipped to the United States from Nagasaki, Japan, the remains of 9 soldiers, 1 marine and 1 civilian employee of the United States hospital ship *Relief*.

In view of the statement of the chief quartermaster at Havana, Cuba, that a competent superintendent and necessary assistants with experience in this class of work could be secured at that point, it was deemed expedient by the Quartermaster-General to have a burial corps organized in Cuba instead of the United States for the disinterment and shipment of the remains buried in that island. Accordingly Mr. C. E. Norton, employed in the chief quartermaster's office at Havana, was designated superintendent of the burial party, and accompanied by two undertakers left Havana December 1, 1900, to enter upon this work. By February 8, 1901, a complete tour of the island had been made and 170 remains, which were interred therein since the operations of the last burial corps, were removed and prepared for shipment by army transport to the depot quartermaster, New York City, whence those applied for were expressed at Government expense to the homes of relatives or friends, and those unclaimed to the Arlington National Cemetery for interment therein. Of these remains 5 were those of army officers, 96 of soldiers, 67 of civilian employees; also the remains of 1 enlisted man of the Navy, 2 contract nurses, and the widow of the late Maj. M. R. Peterson, commissary, U. S. V. (the latter also died in Cuba), Mrs. Peterson's remains being shipped without expense to the United States.

The same careful attention to the preservation of identity of remains was observed in Cuba as in the Philippines and elsewhere, there being but one unidentified soldier among those sent from this island. And it is to be remarked that notwithstanding the fact that so large a proportion of these remains (62) were those of yellow fever victims, efforts to cooperate with the department in securing uninterrupted transit of the various bodies from New York City to the former homes were shown by every State except where the statutes expressly prohibited such transportation.

In Porto Rico the department was unable to remove the remains of the soldier dead buried therein owing to the civil law of the island prohibiting the disinterment of any bodies until three years have

elapsed after burial. Until the expiration of this limit, therefore, the department can take no steps toward bringing to the United States the 28 remains which are buried in that island.

Under an arrangement with the Navy Department, and in accordance with instructions from the Secretary of War, the Quartermaster-General has provided for the disinterment, reencasement in metallic caskets, and shipment to the United States and thence by express to the homes of relatives or friends, as furnished by the Bureau of Navigation, the remains of such officers and enlisted men of the Navy and United States Marine Corps whose graves may be located in the territory visited by the various burial corps during their operations abroad, the Navy Department reimbursing the appropriation for the Quartermaster's Department in the amounts expended for these purposes. During the past fiscal year a total of 66 remains have been thus removed and brought to the United States, 25 being those of enlisted men of the Navy and 41 marines.

Owing to the fact that the United States statutes make no provision for the burial of the remains of civilian employees of the Army in any national cemetery, the department has been obliged to discourage the indiscriminate shipment of such bodies, and hereafter, under approval of the honorable Secretary of War, only those employees' remains will be brought to the United States that are requested by friends or relatives for private burial. As, however, all officers of the Army in outlying territory employing civilians in any capacity have been instructed by military authorities to promptly notify relatives in the event of death, with the information that the Quartermaster's Department will forward the remains at Government expense upon application therefor, no hardship is imposed upon any persons who may desire such remains for private burial.

A much-needed reform has been inaugurated in respect to the burial of persons dying abroad, and upon recommendation of this department the Adjutant-General of the Army has issued instructions placing in effect in all military departments without the limits of the United States uniform sanitary methods of burying soldier remains which will greatly facilitate their subsequent disinterment and preparation for shipment to this country, minimize the danger of infection and surround the work with conditions less offensive.

As might be expected, the department has suffered some criticism from relatives and friends of officers and soldiers at delay in shipment of remains, due to failure to fully understand existing conditions. The officers of this department, however, cognizant of the sacred duty devolving upon them, have shown all possible consideration for the bereaved families and extended every available facility for securing the return of remains with the utmost dispatch. In many cases this office has been the recipient of expressions of deep gratitude and commendation for the satisfactory manner in which these duties were performed, indicating that the efforts put forth by the department, as well as the exceptional liberality of the United States Government in this respect, are in the end fully appreciated.

Respectfully submitted.

W. S. PATTEN,
Deputy Quartermaster-General, U. S. A.

WAR DEPARTMENT,
QUARTERMASTER-GENERAL'S OFFICE,
Washington, D. C., September 15, 1901.

GENERAL: I have the honor to submit the following report of the construction and repair division of this office for the fiscal year ended June 30, 1901:

Congress in the act making appropriations for the support of the Army for the fiscal year 1900-1901 provided, under the head of "Barracks and quarters"..... \$3,000,000.00

Expenditures have been made or authorized from this appropriation approximately as follows:

Authorized for construction and repair of buildings at army posts and general depots	\$1,577,292.48
Expenditures in Porto Rico, Alaska, China, and the Philippine Islands for labor and material to construct and repair shelter for troops, including cost of material purchased in the United States and shipped for that purpose	651,799.90
Expended for hire of regular employees (Appendix A)	13,225.45
Expended for rents and lodgings in connection with the recruiting service (Appendix B)	77,641.08
Expended for rent of storehouses, offices, barracks, quarters, camp ground, etc. (Appendix C)	321,568.18
Balance June 30, 1901	358,469.91
Total	3,000,000.00

Recapitulation of expenditures authorized from the appropriation for barracks and quarters, 1900-1901, for the construction and repair of buildings at permanent posts and depots.

Department, depot, etc.	Construction.	Repairs.	Total.
Department of the East	\$819,439.33	\$60,079.83	\$879,519.16
Department of the Lakes	24,591.00	20,514.45	45,105.45
Department of Texas	2,949.75	11,129.02	14,078.77
Department of Dakota	8,568.00	27,169.98	35,737.98
Department of the Missouri	33,624.38	58,294.65	91,919.03
Department of the Colorado	6,780.00	17,683.69	24,463.69
Department of California	112,336.20	45,704.84	158,041.04
Department of the Columbia	112,831.56	22,365.46	135,201.02
Jeffersonville Depot	17,532.50	1,212.55	18,745.05
New York Depot .....	.....	1,719.83	1,719.83
Philadelphia Depot	10,235.00	6,421.37	16,656.37
St. Louis Depot .....	.....	380.50	380.50
San Francisco Depot .....	.....	291.75	291.75
Fort Totten	7,684.00	1,225.96	8,910.96
Hot Springs Army and Navy General Hospital .....	.....	680.00	680.00
Fort Bayard United States General Hospital .....	.....	24,798.41	24,798.41
West Point	57,862.14	3,161.33	61,023.47
Total	1,244,453.86	332,838.62	1,577,292.48

The following is a list of the buildings which have been authorized to be constructed at the various posts, the cost thereof being included in the foregoing statement under the head of "Construction." Expenditures in Porto Rico are reported separately and are not included under "Department of the East" in this statement:

Post.	Designation.	Material.	Amount authorized.
<i>Department of the East.</i>			
Fort Adams, R. I.	Coal house	Frame	\$6,925.00
	Additional work in remodeling casemates for dormitories	Brick	1,032.00
	Plumbing, etc., in new subsistence storehouse		287.00
Fort Andrews, Mass.	Barrack for 65 men (temporary)	Frame	8,222.00
	1 single officers' quarters (temporary)	do	2,800.00

Post.	Designation.	Material.	Amount authorized.
<i>Department of the East—Continued.</i>			
Fort Andrews, Mass.	Plumbing and earth closets for barracks and quarters.		\$212.91
	Stable and warehouse building (purchased from contractor).	Frame	50.00
Fort Banks, Mass.	Electric wiring new single officers' quarters.		100.00
	Same in new double officers' quarters.		280.00
	Same in new barrack.		310.00
	Extra work on single officers' quarters.		500.00
Fort Barrancas, Fla.	Quartermaster and subsistence storehouse.	Frame	11,740.00
	Ambulance shed.	do	310.30
Fort Caswell, N. C.	Stable and carriage house.	do	110.60
	2 captains' quarters.	do	17,950.00
	Plumbing.		1,400.00
	1 double noncommissioned officers' quarters.	Frame	5,200.00
	Plumbing.		600.00
	Quartermaster's and subsistence storehouse.	Frame	7,340.00
	Lavatory.	do	2,830.00
	Plumbing.		2,000.00
	Ordnance storehouse.	Frame	2,875.00
	Quartermaster's stable.	do	3,650.00
	Coal shed.	do	1,485.00
Fort Carroll, Md.	Fitting up summer squad room, dining and sleeping room in casemates.		265.00
Fort Columbus, N. Y.	Quartermaster's storehouse.	Brick	11,592.00
	Plumbing.		235.00
	Fire apparatus house (roofing quadrangle).	Iron	1,331.00
	Changing casemates into store and issue room (Castle William).	Brick	66.83
Fort Du Pont, Del.	Plumbing in 2 barracks.		4,987.00
	Field officers' quarters.	Frame	6,100.00
	Plumbing.		625.00
	2 single officers' quarters.	Frame	10,600.00
	Plumbing.		1,150.00
	Porches for noncommissioned officers' quarters.	Frame	500.00
Fort Fremont, S. C.	Bakery.	do	1,500.00
	2 single sets noncommissioned officers' quarters.	do	4,475.90
	Plumbing.		400.00
	Quartermaster's stable and wagon room.	Frame	3,100.00
	Coal shed.	do	1,467.00
	Extra work on new buildings.		495.00
Fort Gaines, Ala.	1 barrack for 100 men.	Frame	16,197.00
	1 mess hall and kitchen.	do	5,700.00
	Plumbing.		300.00
	2 single officers' quarters.	Frame	15,448.00
	Plumbing.		600.00
	2 single noncommissioned officers' quarters.	Frame	4,700.00
	Plumbing.		580.00
Governors Island, N. Y.	1 storehouse.	Frame	3,500.00
Great Diamond Island, Maine	Bathroom addition to officers' quarters, No. 12.	do	372.00
	Barrack for 30 men.	do	6,051.00
	Temporary building for stable, storehouse, etc.	do	1,039.00
Fort Greble, R. I.	Remodeling temporary officers' quarters into administration building.	Brick	1,500.00
	Plumbing.		285.00
	Coal shed.	Frame	2,330.00
	Blacksmith shop.	do	847.67
	Extra work on new buildings.		980.00
	Fire apparatus building.	Frame	894.57
	Fitting old engineer building for ordnance storehouse.		1,100.00
	Field officers' quarters.	Frame	9,300.00
	Plumbing.		632.00
	1 single company officers' quarters.	Frame	8,885.00
	Plumbing.		744.00
Fort Hamilton, N. Y.	Temporary stable for 50 horses.	Frame	1,746.96
	Temporary mess hall and kitchen.	do	1,634.00
	Plumbing.		160.00
Fort Heath, Mass.	Barrack for 10 men.	Frame	3,600.00
Fort H. G. Wright, N. Y.	Temporary barrack for 30 men.	do	6,285.00
	Temporary building for stable, coal shed, and storehouse.	do	825.00
	Temporary water-closet building.	do	11.00
	1 double officers' quarters.	do	10,000.00
	Plumbing.		1,390.00
	2 single officers' quarters.	Frame	15,436.00
	Plumbing.		1,180.00
	Guardhouse.	Frame	5,100.00
	Plumbing.		640.00
	Administration building.	Frame	4,427.00
	Plumbing.		92.00
	Hospital stewards' quarters.	Frame	2,725.00
	Plumbing.		300.00

QUARTERMASTER-GENERAL.

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Post.	Designation.	Material.	Amount authorized.
<i>Department of the East—Continued.</i>			
Fort H. G. Wright, N. Y.	2 double noncommissioned officers' quarters	Frame	\$9,626.00
	Plumbing		940.00
	Quartermaster's and subsistence storehouse	Frame	6,748.00
	Bakehouse	do	2,365.00
	Plumbing		67.00
	Stable	Frame	8,929.00
	Shop	do	2,588.00
	Coal shed	do	1,531.00
	Oil house	do	473.00
	Ordnance storehouse	do	3,240.00
	1 field officers' quarters, and 2 single officers' quarters	do	23,821.00
	Plumbing in above		2,040.00
Fort Howard, Md.	Placing 4 temporary buildings on brick piers	Frame	400.00
	Combined blacksmith, carpenter, and wheelwright shop	do	1,100.00
	Storehouse and waiting room on wharf	do	630.00
	Foundations, etc., for "Gunther residence" after removal	Brick	470.00
Fort Jackson, La.	Noncommissioned officers' quarters	Frame	3,241.00
Jackson Barracks, La.	Gun shed and ordnance storehouse	do	332.86
	1 single noncommissioned officers' quarters	do	2,381.00
	Plumbing		375.00
	1 single noncommissioned officers' quarters	Frame	2,225.00
	Plumbing		327.00
Madison Barracks, N. Y.	Converting old hospital into quartermaster's offices and storeroom	Stone	277.00
Fort Mansfield, R. I.	Temporary barrack for 30 men	Frame	6,250.00
	Temporary building for stable, coal shed, and storehouse	do	825.00
	Water-closet building	do	19.31
	1 barrack for 100 men	do	18,890.00
	Plumbing		190.00
	2 single officers' quarters	Frame	14,680.00
	Plumbing		1,390.00
	Double officers' quarters	Frame	8,875.00
	Plumbing		1,180.00
	Administration building	Frame	4,415.00
	Plumbing		87.00
	Hospital (6-bed)	Frame	8,100.00
	Plumbing		660.00
	Hospital steward's quarters	Frame	2,425.00
	Plumbing		280.00
	2 double noncommissioned staff quarters	Frame	8,850.00
	Plumbing		960.00
	Quartermaster's and subsistence storehouse		4,850.00
	Ordnance storehouse	Frame	3,020.00
	Stable	do	3,300.00
	Shop	do	1,560.00
	Bakery	do	2,440.00
	Plumbing		45.00
	Guardhouse	Frame	3,125.00
	Plumbing		271.00
	Oil house	Frame	470.00
	Lavatory	do	2,500.00
	Plumbing		2,172.00
Fort McRee, Fla.	1 single officers' quarters	Frame	2,625.00
	1 barrack for 30 men	do	5,940.00
	1 storehouse	do	1,575.00
Fort Michie, N. Y.	1 double noncommissioned officers' quarters	do	4,216.00
	Plumbing		597.00
	Guardhouse	Frame	2,691.00
Mobile, Ala.	Temporary storehouse at wharf	do	275.00
Fort Monroe, Va.	2 water-closet buildings	Brick	3,244.00
	Plumbing		2,495.00
	Addition to present water-closet building	Brick	535.00
	Plumbing		429.00
	2 additions to present bathhouse	Brick	4,201.00
	Plumbing		3,511.00
	Shelter for searchlight recently turned over by Engineer Department	Frame	164.00
Fort Morgan, Ala.	Plumbing in summer kitchens for officers' quarters		1,750.00
	Stable guard building	Frame	74.00
Fort Myer Signal Corps Post, Va.	Temporary wagon shed	do	60.00
	Permanent storehouse for Government property	do	1,387.00
Fort Pickens, Fla.	Lavatory	do	1,942.00
	Plumbing		2,449.00
	Porches for 2 completed officers' quarters	Frame	2,150.00
	Changing barrack into mess and day rooms	do	169.00
Fort Porter, N. Y.	Plumbing in officers' quarters		475.00
Fort Preble, Me.	1 field officers' quarters	Brick	12,500.00
	Plumbing		980.00

Post.	Designation.	Material.	Amount authorized.
<i>Department of the East—Continued.</i>			
Fort Preble, Me	1 company officers' quarters	Brick	\$10,900.00
	Plumbing .....	.....	910.00
Fort Revere, Mass	Temporary barrack for 35 men	Frame	6,300.00
	Plumbing and earth closets for barracks and quarters .....	.....	138.90
	Fitting up old building for stable and storehouse	Frame	50.00
	2 single officers' quarters .....	.....do	15,600.00
	Plumbing .....	.....do	1,130.00
	Double officers' quarters	Frame	10,000.00
	Plumbing .....	.....do	845.00
	Hospital (6 beds)	Frame	3,400.00
	Plumbing .....	.....do	630.00
	Hospital steward's quarters	Frame	2,450.00
	Plumbing .....	.....do	225.00
	2 double noncommissioned officers' quarters	Frame	10,200.00
	Plumbing .....	.....do	950.00
	Guardhouse	Frame	2,600.00
	Plumbing .....	.....do	320.00
	Bakehouse	Frame	2,500.00
	Quartermaster's stable .....	.....do	3,560.00
	Ordnance storehouse .....	.....do	2,800.00
	Shop building .....	.....do	950.00
	Fuel shed .....	.....do	1,800.00
	Oil house .....	.....do	300.00
Fort St. Philip, La	Stable for mules and carts .....	.....do	200.00
Fort Screven, Ga	Quartermaster's and ordnance storehouse .....	.....do	2,500.00
Fort Strong, Mass	Addition to temporary officers' quarters .....	.....do	173.94
	Completing 2 temporary barracks and mess hall .....	.....do	2,050.00
	Boathouse .....	.....do	997.87
Sullivans Island, S. C	1 commanding officer's quarters	Frame	14,393.00
	Plumbing .....	.....do	550.00
	5 captains' quarters	Frame	50,335.00
	Plumbing .....	.....do	2,625.00
	5 lieutenants' quarters	Frame	43,050.00
	Plumbing .....	.....do	2,625.00
	6 noncommissioned staff quarters	Frame	17,652.00
	Plumbing .....	.....do	1,500.00
	1 hospital steward's quarters	Frame	2,942.00
	Plumbing .....	.....do	250.00
	1 stable	Frame	3,986.00
	1 guardhouse .....	.....do	6,135.00
	Plumbing .....	.....do	650.00
	1 shop	Frame	2,503.00
	1 coal shed .....	.....do	2,700.00
	1 oil house	Iron	485.00
	1 quartermaster's and subsistence storehouse	Frame	3,965.00
	1 ordnance storehouse .....	.....do	3,116.00
Fort Terry, N. Y.	1 double noncommissioned officers' quarters .....	.....do	4,259.00
	Plumbing .....	.....do	466.00
	1 single noncommissioned officers' quarters for engineer	Frame	2,390.00
	Plumbing .....	.....do	250.00
Fort Warren, Mass	Fitting temporary barrack for commissary storehouse	Frame	1,200.00
	Wagon shed .....	.....do	200.00
	Building to shelter cremator	Brick	637.86
	Waiting room and freight house near wharf	Frame	697.96
Washington Barracks, D. C. ..	Stable guardhouse	Brick	2,947.00
	Plumbing .....	.....do	300.00
	Converting temporary stable into storehouse	Frame	529.00
Fort Washington, Md	Wood shed .....	.....do	100.00
	Plumbing in 2 barracks .....	.....do	3,990.00
	Plumbing in 6 single officers' quarters .....	.....do	3,594.00
	Electric wiring 2 barracks .....	.....do	1,200.00
	Electric wiring 6 single officers' quarters .....	.....do	1,300.00
	Boathouse	Frame	1,010.00
	Quartermaster's stable .....	.....do	4,216.50
	Coal shed .....	.....do	1,925.00
	Single noncommissioned staff quarters .....	.....do	3,353.00
	Plumbing .....	.....do	450.00
	1 oil house	Frame	497.00
Fort Wetherill, R. I.	Temporary building for stable, wagon room, storeroom, and coal shed .....	.....do	768.00
	Extra work on new barrack .....	.....do	125.02
	Completing temporary stable for permanent use	Frame	420.00
Fort Williams, Me	Addition to temporary officers' quarters .....	.....do	810.00
	Converting temporary barracks into storehouse, temporary mess hall into shops, temporary hospital into school and reading rooms .....	.....do	4,528.24
	1 field officers' quarters and 2 company officers' quarters	Brick	37,382.00
	Water-closet in administration buildingdo	251.15

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Post.	Designation.	Material.	Amount authorized.
<i>Department of the East—Continued.</i>			
Fort Wood, N. Y	Quartermaster's stable and wagon shed	Frame	\$475.00
	Addition to mess building	do	1,185.00
	Laundry thereunder		437.50
	Coal shed	Frame	1,382.50
Total			819,439.33
<i>Department of the Lakes.</i>			
Columbus Barracks, Ohio	Clothing storehouse	Brick	6,241.00
Fort Sheridan, Ill	Addition to guardhouse	do	9,375.00
	Plumbing		1,325.00
	Addition to light battery gun shed	Brick	1,896.00
	Plumbing		104.00
Fort Wayne, Mich	Quartermaster's stable for 30 animals	Brick	5,430.00
	Plumbing		220.00
Total			24,591.00
<i>Department of Texas.</i>			
Fort Clark, Tex	Labor for constructing boiler shed		40.00
Fort Sam Houston, Tex	Enlarging battery guardhouse	Frame	334.75
	Temporary storehouse	do	2,575.00
Total			2,949.75
<i>Department of Dakota.</i>			
Fort Assiniboine, Mont	Reconstructing commanding officers' quarters	Brick	2,700.00
Fort Harrison, Mont	Oil house	Frame	320.00
Fort Yellowstone, Wyo	Teamster's quarters	do	2,715.00
	Shops	do	1,635.00
	Addition to commissary storehouse	do	1,198.00
Total			8,568.00
<i>Department of the Missouri.</i>			
Fort Crook, Nebr	Fire-apparatus house	Brick	2,426.00
	Plumbing		111.00
	Wagon shed	Frame	2,704.60
Jefferson Barracks, Mo	Ordinance storehouse	Brick	1,285.00
Fort Leavenworth, Kans	Light battery guardroom, shops, etc	do	4,578.00
	Plumbing		366.00
	Storehouse	Brick	8,997.00
Fort Logan, H. Roots, Ark	Fire-apparatus house	do	2,212.71
Fort Riley, Kans	Oil house	Frame	3,070.00
	Remodeling 3 lavatories	Brick	1,954.00
	Plumbing		2,723.00
	Lavatories in 3 artillery barracks		1,069.11
	Ordinance storehouse	Brick	1,962.00
Fort Sill, Okla	Fire-apparatus house	Frame	165.96
Total			33,624.38
<i>Department of the Colorado.</i>			
Fort D. A. Russell, Wyo	Garbage crematory	Brick	1,590.00
Fort Huachuca, Ariz	Lavatory	Frame	4,850.00
Fort Mackenzie, Wyo	Corral	do	225.00
	Temporary shed for bake oven	do	115.00
Total			6,780.00
<i>Department of California.</i>			
Fort Point, Cal	1 single officers' quarters	Frame	7,081.00
	Plumbing		993.00
	1 double officers' quarters	Frame	12,967.00
	Plumbing		2,105.00
Honolulu, H. I.	Temporary buildings for general hospital	Frame	2,619.29
	Office building for transport service	do	595.00
Fort Miley, Cal	2 single officers' quarters	do	17,310.00
	Plumbing		1,300.00
	1 double officers' quarters	Frame	16,680.00
	Plumbing		1,300.00
	2 double noncommissioned officers' quarters	Frame	10,840.00
	Plumbing		1,120.00
	1 quartermaster's and subsistence storehouse	Frame	10,840.00
	1 ordnance storehouse	do	3,520.00
	1 quartermaster's stable	do	3,910.00
	1 guardhouse	do	3,970.00
	Plumbing		230.00

Post.	Designation.	Material.	Amount authorized.
<i>Department of California—Continued.</i>			
Fort Miley, Cal	1 administration building	Frame.....	\$3,940.00
	Plumbing .....	.....	160.00
Presidio of San Francisco, Cal.	Fitting up building No. 23 as school and reading room	Frame.....	383.00
	Storehouse at model camp	do.....	300.00
	Addition to subsistence storehouse	do.....	100.00
United States General Hospital, Presidio of San Francisco, Cal.	Completion of drying room .....	.....	654.50
	Chapel and reading-room building	Frame.....	2,780.00
	Commanding officer's quarters	do.....	9,118.83
	Plumbing .....	.....	650.00
	Double officers' quarters	Frame.....	16,185.58
	Plumbing .....	.....	1,250.00
	Reconstructing kitchen destroyed by fire	Frame.....	7,625.00
San Diego Barracks, Cal.	Ordnance and signal property storehouse	do.....	297.00
	Stable and wagon shed	do.....	1,392.00
Total			142,336.20
<i>Department of the Columbia.</i>			
Fort Casey, Wash.	Temporary guardhouse	Frame.....	438.00
Fort Columbia, Wash.	Single officers' quarters	do.....	9,876.00
	Plumbing .....	.....	575.00
	Oil house	Iron.....	350.00
	Administration building	Frame.....	6,464.00
	Plumbing .....	.....	350.00
	Double officers' quarters	Frame.....	13,043.00
	Plumbing .....	.....	895.00
	Double noncommissioned officers' quarters	Frame.....	4,200.00
	Plumbing .....	.....	550.00
	Hospital steward's quarters	Frame.....	2,253.00
	Plumbing .....	.....	350.00
	Guardhouse	Frame.....	3,279.00
	Plumbing .....	.....	350.00
	Bakehouse	Frame.....	2,145.00
	Plumbing .....	.....	25.00
	Stable and wagon room	Frame.....	2,836.00
	Quartermaster's and subsistence storehouse	do.....	4,682.00
	Workshop	do.....	1,502.00
	Hospital (6-bed)	do.....	11,638.00
	Plumbing .....	.....	600.00
Fort Flagler, Wash.	Fire-apparatus house	Frame.....	700.00
	Ordnance storehouse, with 2 office rooms	do.....	2,921.00
	Lavatory	do.....	2,485.00
	Plumbing .....	.....	2,750.00
Fort Lawton, Wash.	Sheds for corral on reservation	Frame.....	1,250.00
	Bake house	do.....	1,769.30
	Plumbing .....	.....	81.30
	Hospital steward's quarters	Frame.....	1,893.65
	Plumbing .....	.....	253.45
	Stable and wagon shed	Frame.....	2,725.70
	Plumbing .....	.....	215.20
	Administration building	Frame.....	8,763.40
	Plumbing .....	.....	205.60
	Guardhouse	Frame.....	9,026.50
	Plumbing .....	.....	1,434.60
Fort Stevens, Oreg.	Lavatory for enlisted men	Frame.....	2,764.16
	Plumbing .....	.....	2,460.00
	Wagon shed	Frame.....	244.20
	Fuel sheds for servants' quarters, lavatory for officers' quarters, barrack, etc., lavatory annex to guardhouse, wood boxes for administration building, guardhouse, etc., and cellar for commissary storehouse	do.....	3,960.00
	Detached lavatory	do.....	2,848.00
	Plumbing .....	.....	2,750.00
	Tearing down old and rebuilding new engineer stable .....	.....	379.50
Total			112,831.56
<i>Depots and independent posts.</i>			
Jeffersonville depot, Ind.	1 additional storehouse	Frame.....	13,100.00
	Alterations in old buildings	Frame.....	3,895.50
	Plumbing .....	.....	372.00
	Sheds for carts and ambulances	Frame.....	165.00
Total			17,532.50
Philadelphia depot, Pa.	Extension of arsenal walls .....	.....	4,395.00
	Elevator in new warehouse .....	.....	2,860.00
	Tearing down and rebuilding shed	Iron.....	3,000.00
Total			10,255.00

Post.	Designation.	Material.	Amount authorized.
<i>Depots and independent posts—Continued.</i>			
Fort Totten, N. Y.....	Ordinance storehouse.....	Brick.....	\$6,909.00
	Boathouse.....	Frame.....	775.00
Total			7,684.00
West Point, N. Y	Renovation of old army service barracks	Brick.....	3,450.00
	Plumbing		1,192.15
	Heating		949.99
	3 double officers' quarters	Brick.....	48,000.00
	Plumbing		3,600.00
	Machinery for quartermaster's shops		670.00
Total			57,862.14

MILITARY POSTS APPROPRIATION.

"For the construction of buildings at, and the enlargement of, such military posts as in the judgment of the Secretary of War may be necessary, and for the erection of barracks and quarters for the artillery in connection with the adopted project for seacoast defense, and for the purchase of suitable building sites for said barracks and quarters," the act making appropriations for sundry civil expenses of the Government for the fiscal year ending June 30, 1901, appropriated \$1,000,000.

The law provided that of this sum the following amounts should be expended for purposes stated below:

For repairs to barracks and quarters at Fort Leavenworth, Kans.....	\$30,000
Toward construction of water and sewerage system and for roads and walks and grading at Fort Lincoln, N. Dak.....	40,000
For construction of additional stables at Fort Riley, Kans.....	30,000
For buildings and other necessary improvements at Fort Meade, S. Dak....	50,000
For continuing work of rebuilding quarters and for rebuilding regimental guardhouse at Fort D. A. Russell, Wyo.....	50,000
For acquiring by purchase or condemnation the land in the square surrounding Fort Constitution, N. H	30,000
Total	230,000

This left a balance of \$770,000 available for expenditure at other posts, and the amount apportioned to each post for purchase of land and construction of buildings from this balance is shown in the following table:

Post.	Buildings, etc.	Material.	Allotments.	Total.
Fort Adams, R. I.....	Extending piazzas of new dormitories.....	Brick.....		\$150.00
Fort Baker, Cal.....	Barracks for 100 men	Frame.....	\$25,890.00	
	Plumbing		4,450.00	
	2 double officers' quarters	Frame.....	29,030.00	
	Plumbing		4,375.00	
	Double noncommissioned officers' quarters.....	Frame.....	5,350.00	
	Plumbing		775.00	
	Hospital	Brick.....	19,680.00	
	Plumbing		2,395.00	
	Hospital stewards' quarters.....	Frame.....	3,370.00	
	Plumbing		475.00	
	Guardhouse.....	Frame.....	5,600.00	
	Plumbing		725.00	
	Bakehouse.....	Frame.....	1,320.00	
	Plumbing		95.00	
	Quartermaster's and subsistence storehouse.....	Frame.....	8,800.00	

Posts.	Buildings, etc.	Material.	Allotment.	Total.
Fort Baker, Cal.	Stable.....	Frame.....	\$4,020.00	
	Plumbing.....		485.00	
	Fuel shed.....	Frame.....	1,600.00	
				\$118,435.00
Fort Banks, Mass.	Coal shed.....	Frame.....		2,493.00
Fort Columbia, Wash.	Barrack for 100 men.....	do.....	26,891.00	
	Plumbing.....		2,300.00	
				29,191.00
Fort Dade, Fla.	1 single noncommissioned officers' quarters.....	Frame.....	2,335.00	
	Plumbing.....		450.00	
				2,785.00
Fort Du Pont Del.	Ordnance storehouse.....	Frame.....		3,850.00
Great Diamond Island, Maine	Purchase of land.....			149,850.00
Fort H. G. Wright, N. Y.	Barracks for 120 men.....	Frame.....	27,094.00	
	Plumbing.....		2,880.00	
	Hospital.....	Brick.....	15,515.00	
	Plumbing.....		1,900.00	
				47,389.00
Fort Howard, Md.	Coal shed.....	Frame.....		1,187.00
Fort Miley, Cal.	Barracks for 100 men.....	do.....	26,930.00	
	Plumbing.....		3,100.00	
				30,030.00
Fort Morgan, Ala.	Mess hall.....	Frame.....	3,920.00	
	Plumbing.....		150.00	
				4,070.00
Fort Mott, N. J.	2 single officers' quarters.....	Frame.....	11,938.00	
	Plumbing.....		1,005.00	
	Ordnance storehouse.....	Frame.....	2,967.00	
				15,910.00
Fort Pickens, Fla.	Coal shed.....	do.....		2,425.00
Fort Point, Cal.	Barracks for 100 men.....	do.....	23,525.00	
	Plumbing.....		4,480.00	
				28,005.00
Fort Revere, Mass.	Barracks for 100 men.....	Frame.....	22,740.00	
	Plumbing.....		2,525.00	
				25,265.00
Fort Rodman, Mass.	2 single officers' quarters.....	Frame.....	7,590.00	
	Plumbing.....		689.00	
				8,279.00
Fort Stevens, Oreg.	Hospital.....	Frame.....	20,285.00	
	Plumbing.....		1,280.00	
				21,565.00
Fort Strong, Mass.	1 double officers' quarters.....	Brick.....	15,661.00	
	Plumbing.....		1,129.00	
	1 double officers' quarters.....	Brick.....	10,661.00	
	Plumbing.....		1,018.00	
	Stable.....	Frame.....	3,900.00	
	Bakery.....	do.....	1,394.00	
	Plumbing.....		58.00	
	Quartermaster's and subsistence storehouse.....	Brick.....	13,181.00	
	1 double noncommissioned officer's quarters.....	Brick.....	4,816.00	
	Plumbing.....		523.00	
	Hospital.....	Brick.....	19,595.00	
	Plumbing.....		1,107.00	
	Hospital stewards' quarters.....	Brick.....	3,095.00	
	Plumbing.....		218.00	
	Barracks for 110 men.....	Brick.....	28,640.00	
	Plumbing.....		2,507.00	
				107,474.00
Sullivan's Island, South Carolina.	Barracks for 240 men.....	Frame.....	55,482.00	
	Plumbing.....		4,600.00	
				60,082.00
Fort Terry, N. Y.	Purchase of land.....			65,050.00
Fort Washington, Md.	Administration building.....	Frame.....	4,192.00	
	Plumbing.....		175.00	
	Guardhouse.....	Frame.....	7,500.00	
	Plumbing.....		900.00	
				12,767.00
Fort Wetherill, R. I.	Barracks for 26 men.....	Frame.....	4,335.00	
	Plumbing.....		650.00	
	1 double noncommissioned officers' quarters.....	Frame.....	3,935.00	
	Plumbing.....		600.00	
	Storm doors both buildings.....		124.00	
				9,648.00
	Printing and advertising.....			1,728.08
	Balance available for extra work on buildings and for purchase of land.....			22,376.97
Total.....				770,000.00

SPECIAL MILITARY POSTS APPROPRIATIONS.

The following table shows the disposition made of the foregoing special appropriations. (Of the \$30,000 allotted for purchase of land at Fort Constitution, N. H., none was expended.)

Post.	Buildings, etc.	Material.	Allotments.	Total.
Fort D. A. Russell, Wyo.....	2 double officers' quarters	Brick	\$20,700.00	\$50,000.00
	Plumbing .....	.....	1,847.00
	Wiring .....	.....	600.00
	1 double officers' quarters	Brick	13,750.00	
	Plumbing .....	.....	1,275.00
	Wiring .....	.....	420.00
	Guardhouse	Brick	6,800.00	
	Plumbing .....	.....	913.00
	Wiring .....	.....	200.00
	Balance unexpended .....	.....	3,496.00
Fort Leavenworth, Kans....	1 addition each to barracks Nos. 47, 48, and 49, increasing capacity of each to 100 men.	24,357.00	30,000.00
	Plumbing .....	.....	5,619.00
	Balance unexpended .....	.....	24.00
Fort Lincoln, N. Dak.	2 8-inch wells	800.04	40,000.00
	Water-supply system .....	.....	10,300.00
	Sewerage system .....	.....	16,250.00
	Pump house and pit	Brick	6,035.00	
	Pumps, boiler, etc .....	.....	4,250.00
	3 cisterns .....	.....	2,219.50
	Advertising .....	.....	35.89
	Balance unexpended .....	.....	109.57
Fort Meade, S. Dak.	Barrack for 100 men	Stone	25,750.00	50,000.00
	Plumbing .....	.....	2,487.00
	Heating .....	.....	2,512.00
	Wiring .....	.....	370.00
	Guardhouse	Stone	8,814.00	
	Plumbing .....	.....	887.10
	Heating .....	.....	583.00
	Wiring .....	.....	146.60
	2 double noncommissioned officers' quarters.	Brick	4,496.00	
	Plumbing .....	.....	495.00
	Wiring .....	.....	180.00
	Fire station	Brick	1,834.00	
	Plumbing .....	.....	90.00
	Wiring .....	.....	32.68
	Powder magazine	Brick	714.00	
	Improving road and fencing water supply.	.....	500.00
	Printing and advertising .....	.....	61.40
	Balance unexpended .....	.....	47.32
Fort Riley, Kans.	2 artillery stables for 70 horses each.	Brick	25,384.00	30,000.00
	Plumbing .....	.....	996.00
	Corral walls and gates .....	.....	2,500.00
	Balance unexpended .....	.....	1,120.00

APPROPRIATION FOR HOSPITALS.

In the "act making appropriation for the support of the Regular and Volunteer Army for the fiscal year ending June 30, 1901," Congress appropriated "for construction and repair of hospitals at military posts already established and occupied, including the extra-duty pay of enlisted men employed on the same, and including also all expenditures for construction and repairs required at the Army and Navy Hospital at Hot Springs, Arkansas, except quarters for the officers, two hundred and fifty thousand dollars: *Provided*, That for the purpose of improving and repairing the Army and Navy General Hospital at Hot Springs, Arkansas, and for the reconstructing and refitting

the interior of the bath house, for the construction of a boiler house and the purchase of boiler, for establishing ice and electric plants, and for the construction of a reservoir with a capacity of one hundred and fifty thousand gallons the sum of fifty-five thousand dollars, or so much thereof as may be necessary, of the foregoing may be used, said sum to be expended under the direction of the Secretary of War."

Based on estimates approved by the Medical Department the remaining \$195,000 has been apportioned as follows:

Post.	Amount.	Post.	Amount.
<i>Department of the East.</i>		<i>Department of the Missouri—Cont'd.</i>	
Fort Adams.....	\$2,644.22	Fort Leavenworth.....	\$913.55
Fort Banks.....	28.00	Fort Logan H. Roots.....	743.26
Fort Barrancas.....	2,329.88	Fort Niobrara.....	2,080.49
Fort Columbus.....	662.45	Fort Reno.....	150.19
Fort Ethan Allen.....	19.23	Fort Riley.....	2,463.24
Fort Fremont.....	97.63	Fort Robinson.....	20,583.20
Fort Greble.....	47.50	Fort Sill.....	1,756.97
Fort Hamilton.....	437.22	Total.....	29,784.90
Fort Hancock.....	26.50	<i>Department of Dakota.</i>	
Fort Hunt.....	217.00	Fort Assiniboine.....	388.85
Jackson Barracks.....	736.30	Fort Harrison.....	575.45
Key West Barracks.....	144.50	Fort Keogh.....	19,908.22
Madison Barracks.....	1,964.31	Fort Meade.....	1,207.66
Fort McHenry.....	225.97	Fort Snelling.....	387.32
Fort McPherson.....	1,692.53	Fort Yates.....	118.22
Fort Monroe.....	966.00	Fort Yellowstone.....	125.69
Fort Morgan.....	920.25	Total.....	22,711.41
Fort Myer.....	1,295.85	<i>Department of the Colorado.</i>	
Fort Niagara.....	196.91	Fort Apache.....	897.14
Fort Ontario.....	17,537.42	Fort D. A. Russell.....	792.20
Fort Porter.....	1,202.00	Fort Douglas.....	828.84
Fort Preble.....	525.00	Fort Du Chesne.....	610.50
Fort St. Philip.....	498.06	Fort Grant.....	580.74
Fort Schuyler.....	470.11	Fort Huachuca.....	396.50
Fort Screven.....	288.22	Fort Logan.....	1,181.27
Fort Slocum.....	6,231.32	Fort Washakie.....	501.46
Sullivan's Island.....	18,707.00	Fort Wingate.....	179.60
Fort Trumbull.....	8.10	Total.....	5,967.95
Fort Wadsworth.....	617.00	<i>Department of California.</i>	
Fort Warren.....	1,353.65	Alcatraz Island.....	4,192.00
Washington Barracks.....	2,347.97	Benicia Barracks.....	443.08
Fort Washington.....	19,325.00	Fort McDowell.....	1,274.87
Fort Williams.....	637.25	Presidio of San Francisco.....	1,570.14
Fort Wood.....	230.83	Total.....	7,479.54
Mayaguez, P. R.....	1,522.70	<i>Department of the Columbia.</i>	
San Juan, P. R.....	557.83	Boise Barracks.....	422.90
Ponce, P. R.....	1,376.15	Fort Casey.....	91.20
Total.....	88,111.88	Fort Flagler.....	255.60
<i>Department of the Lakes.</i>		Vancouver Barracks.....	267.60
Fort Brady.....	322.20	Fort Walla Walla.....	348.36
Columbus Barracks.....	1,068.15	Total.....	1,385.66
Fort Sheridan.....	612.30	<i>Miscellaneous hospitals.</i>	
Fort Thomas.....	1,044.91	Philippine Islands.....	7,500.00
Fort Wayne.....	127.60	Hot Springs Army and Navy Hos- pital.....	805.00
Total.....	3,175.16	Fort Bayard General Hospital.....	15,849.64
<i>Department of Texas.</i>		Fort Totten.....	567.50
Fort Bliss.....	2,828.78	Total.....	24,722.14
Fort Brown.....	928.50		
Fort Clark.....	1,005.44		
Camp Eagle Pass.....	418.17		
Fort McIntosh.....	283.00		
Fort Ringgold.....	819.60		
Fort Sam Houston.....	1,775.40		
Total.....	8,008.89		
<i>Department of the Missouri.</i>			
Fort Crook.....	39.00		
Jefferson Barracks.....	1,105.00		

RECAPITULATION.

Department of the East.....	\$88,111.85
Department of the Lakes.....	3,175.16
Department of Texas.....	8,008.89
Department of the Missouri.....	29,784.90
Department of Dakota.....	22,711.41
Department of the Colorado.....	5,967.95
Department of California.....	7,479.54
Department of the Columbia.....	1,385.66
Miscellaneous.....	24,722.14
Balance.....	3,652.47
Grand total.....	195,000.00

APPROPRIATION FOR HOSPITAL STEWARDS' QUARTERS.

In the army appropriation act for the fiscal year ending June 30, 1901, Congress appropriated \$20,000 "for construction of quarters for hospital stewards at military posts already established and occupied, including the extra-duty pay of enlisted men employed on the same."

This sum has been apportioned to the posts named below for construction and repair work:

Post.	Amount.	Post.	Amount.
Fort Adams.....	\$110.00	Fort Morgan.....	\$50.00
Fort Apache.....	296.14	Fort Myer.....	60.00
Fort Bayard.....	186.00	Fort Niobrara.....	123.09
Fort Brady.....	52.25	Fort Ontario.....	2,694.27
Fort Brown.....	220.00	Fort Preble.....	12.50
Boise Barracks.....	44.00	Fort Porter.....	30.75
Columbus Barracks.....	359.14	Fort Riley.....	316.72
Fort Columbus.....	554.00	Fort Robinson.....	7.66
Fort Crook.....	100.00	Fort Sam Houston.....	267.23
Fort D. A. Russell.....	12.50	Fort Schuyler.....	69.62
Fort Douglas.....	67.35	Fort Screven.....	611.81
Fort Ethan Allen.....	48.68	Fort Sill.....	57.50
Fort Flagler.....	331.68	Fort Slocum.....	266.26
Fort Grant.....	178.88	Fort Snelling.....	998.00
Governors Island.....	86.00	Fort Terry.....	3,696.35
Fort Greble.....	213.51	Fort Thomas.....	69.00
Fort Hamilton.....	31.57	Fort Totten.....	57.50
Fort Hancock.....	90.90	Fort Trumbull.....	38.00
Hot Springs.....	55.00	Fort Warren.....	315.88
Fort Huachuca.....	108.50	Fort Walla Walla.....	19.00
Fort Keogh.....	35.18	Washington Barracks.....	652.00
Fort Leavenworth.....	175.17	Fort Washington.....	57.20
Fort Logan.....	167.70	Fort Washakie.....	15.00
Fort Logan H. Roots.....	735.27	Fort Wayne.....	38.45
Madison Barracks.....	3,447.29	Fort Wingate.....	62.88
Fort McDowell.....	96.46	Fort Yellowstone.....	45.61
Fort McIntosh.....	290.50	Balance.....	181.58
Fort McPherson.....	78.48		
Fort Meade.....	387.99		
Fort Monroe.....	628.00	Total.....	20,000.00

CONSTRUCTION OF BUILDINGS FOR HOSPITALS AND HOSPITAL STEWARDS' QUARTERS.

The following is a list of new buildings authorized to be constructed at various posts. The cost of construction, plumbing, and gas piping (or electric wiring) of these buildings (except the work at Hot Springs, Ark., under special appropriation) is included in the foregoing tables of appropriations for hospitals and hospital stewards' quarters, the cost of heating apparatus for the hospitals being defrayed from the appropriation for regular supplies. Of the buildings enumerated, the new hospital at Fort Ontario, the hospital addition at Alcatraz Island and the stewards' quarters at Madison Barracks, the addition to the hospital stewards' quarters at Fort Logan H. Roots, also the new service build-

ings and reservoir and the remodeling work at Hot Springs, have been reported completed.

Post.	Designation.	Material.	Amount authorized.
Alcatraz Island, Cal.	Hospital addition	Frame	\$2,247.00
	Plumbing		475.00
Fort Barrancas, Fla.	Isolation ward	Frame	1,450.00
	Plumbing		250.00
Fort Bayard, N. Mex.	Solarium	Glass	1,039.00
Fort Keogh, Mont.	Hospital for 12 beds	Brick	18,247.50
	Plumbing		1,357.00
	Gas piping		190.00
Fort Morgan, Ala.	Deadhouse		460.00
Fort Ontario, N. Y.	Hospital for 12 beds	Brick	16,444.00
	Plumbing		977.90
	Gas piping		95.00
Fort Robinson, Nebr.	Hospital for 12 beds	Brick	18,780.00
	Plumbing		1,100.00
	Gas piping		60.00
Fort Slocum, N. Y.	Pavilion ward	Frame	4,435.00
	Plumbing		900.00
Sullivan's Island, S. C.	Hospital for 24 beds	Frame	17,532.00
	Plumbing		900.00
	Electric wiring		275.00
Fort Washington, Md.	Hospital for 12 beds	Brick	17,050.00
	Plumbing		1,700.00
	Electric wiring		450.00
	Total for new buildings from the general hospital appropriation.		106,424.40
Fort Logan H. Roots, Ark.	Addition to hospital stewards' quarters		648.96
Madison Barracks, N. Y.	1 set hospital stewards' quarters	Brick	2,980.00
	Plumbing		230.00
	Gas piping		22.00
Fort Monroe, Va.	Addition to hospital stewards' quarters		628.00
Fort Ontario, N. Y.	1 set hospital stewards' quarters	Brick	2,490.00
	Plumbing		175.00
	Gas piping		20.00
Fort Screven, Ga.	Detached kitchen for hospital stewards' quarters		510.00
Fort Snelling, Minn.	Addition to hospital stewards' quarters		925.00
Fort Terry, N. Y.	1 set hospital stewards' quarters	Brick	3,330.00
	Plumbing		300.00
	Gas piping		40.00
	Total for new buildings from the appropriation for hospital stewards' quarters.		12,306.96
Hot Springs Army and Navy Hospital, Arkansas.	Refitting bath house		10,193.08
	2 new service buildings	Brick	8,730.00
	Plumbing		1,248.24
	Reconstruction of plumbing system		3,079.24
	Reservoir	Concrete	2,500.00
	Boiler house	Brick	11,993.00
	New boilers		3,774.50
	Laundry machinery		1,806.97
	Ice-making and refrigerating plant		2,898.24
	Reconstruction to provide chemical laboratory, reading rooms, operating room, and dispensary.		2,211.78
	Lighting and power plant		6,565.00
	Total from special appropriation		55,000.00

ARMY TRANSPORTATION APPROPRIATION.

The following aggregate expenditures have been authorized from this appropriation for the fiscal year 1900-1901:

For structural water supply, sewerage, drainage, etc.	\$386,846.02
For roads, walks, grading, bridges, etc.	205,914.36
For wharves	65,710.10
For miscellaneous purposes in connection with construction and repair work	44,909.32
Total	703,379.80

REGULAR SUPPLIES APPROPRIATIONS.

From this appropriation there has been allotted for—

Heating apparatus.....	\$148,260.61
Lighting apparatus.....	49,275.96
Cooking apparatus.....	2,358.20
Repairs to bakeries.....	3,548.43
Construction of bakehouses, and other buildings as enumerated below..	37,478.92
Miscellaneous.....	16,175.00
Total.....	257,097.12

List of buildings authorized from regular-supplies funds.

Post.	Designation.	Material.	Cost.
Fort Wood, New York Harbor	Bakery.....	Frame.....	\$4,320.00
Fort Banks, Mass.....	do.....	do.....	4,800.00
Fort Greble, B. I.....	Bakery addition.....	do.....	1,215.00
Fort Washington, Md.....	Bakery.....	do.....	2,697.85
San Juan, P. R.....	do.....	do.....	1,955.00
Fort Riley, Kans.....	4 hay sheds.....	do.....	13,296.00
Jeffersonville Depot, Ind....	Power house.....	Brick.....	9,195.07
Total.....			37,478.92

CONSTRUCTION OF POSTS FOR COAST ARTILLERY.

The allotments made from funds of the fiscal year 1900–1901 for construction and plumbing of buildings to shelter garrisons at seacoast fortifications are included in the foregoing tables showing expenditures from the appropriations for “Barracks and quarters,” “Military posts,” “Hospitals,” and “Hospital stewards’ quarters.” The cost of heating apparatus and electric wiring has, in most cases, been defrayed from the appropriation for regular supplies, and the cost of water and sewer systems, wharves, roads, walks, and grading has been charged to Army transportation.

Including all buildings completed up to July 24, 1901, there are accommodations for 358 officers and 9,806 enlisted men at coast artillery posts. Of these, quarters for 12 officers and barracks for 1,468 men are in temporary buildings, and old barracks for 308 men are not suitable for continued occupancy. There were under construction at the end of the fiscal year quarters for 61 officers and barracks for 1,400 men. Adding these and deducting the temporary and unsuitable buildings above referred to, there will be permanent and suitable accommodations for approximately 407 officers and 9,430 enlisted men of the coast artillery on completion of the buildings under construction on June 30, 1901.

Following is a brief summary of the principal building operations at coast artillery posts:

Fort Andrews, Mass.—A temporary barrack for 65 men and temporary quarters for 1 officer were completed at this post in February, 1901.

Fort Adams, R. I.—The work of remodeling dormitories over casemates to provide accommodations for 339 men commenced in June, 1900, was completed on June 1, 1901. The subsistence storehouse, quartermaster’s stable, wagon shed, and double set of noncommissioned staff quarters authorized in the previous fiscal year have been com-

pleted; and a coal shed authorized in September, 1900, was completed February 28, 1901.

Fort Baker, Cal.—A water and sewer system, a barrack for 100 men, 2 double officers' quarters, a double set of noncommissioned officers' quarters, a hospital, a steward's quarters, a guardhouse, bakehouse, storehouse, stable, and fuel shed were placed under contract in June, 1901.

Fort Banks, Mass.—Barracks for 100 men and five sets of officers' quarters contracted for in June, 1900, were completed in January, 1901. A coal shed, built from this year's funds, was also completed in January, 1901, and a bakery is now under construction.

Fort Caswell, N. C.—Permanent barracks for 100 men, a mess hall, 2 single officers' quarters, and 1 double noncommissioned officers' quarters, erected from funds of the preceding year, were completed in April, 1901. The construction of a wharf has been authorized and is nearly completed. The following additional buildings were contracted for in June, 1901: Two captains' quarters, 1 double noncommissioned officers' quarters, a quartermaster's and subsistence storehouse, a lavatory, an ordnance storehouse, a quartermaster's stable, and a coal shed.

Fort Columbia, Wash.—Work on the following buildings was commenced before the close of the fiscal year: One barrack for 100 men, 1 double and 1 single set officers' quarters, hospital, hospital steward's quarters, oil house, administration building, 1 double noncommissioned officers' quarters, guardhouse, bakehouse, stable, workshop, and storehouse.

Fort De Soto, Fla.—The construction of a barrack for 100 men, a mess room and kitchen, 3 single officers' quarters, and other buildings, commenced in the preceding fiscal year, was completed in January, 1901.

Fort Du Pont, Del.—Barracks for 200 men, 6 single officers' quarters, and several other buildings for a two-company post were placed under contract at this post in June, 1900, and were completed between February and July, 1901. From funds of the fiscal year 1901 there are now under construction at this post 1 field and 2 single officers' quarters. During the year the construction of a water system, a sewer system, and an ordnance storehouse was begun and completed.

Fort Flagler, Wash.—Work on barrack for 100 men and 4 single sets officers' quarters commenced in May, 1900, has been completed. A fire-apparatus house and an ordnance storehouse have been completed from funds of the fiscal year 1901, and work on a lavatory for enlisted men has been commenced.

Fort Gaines, Ala.—At this post a barrack for 100 men, with mess hall and kitchen, 2 single sets officers' quarters, 2 single sets noncommissioned officers' quarters, and a storehouse were placed under contract on December 5, 1900. The progress of the work being unsatisfactory, the work was taken out of the hands of the contractor and is being completed by his bondsmen.

Fort Greble, R. I.—The barrack for 100 men, 2 single officers' quarters, and 1 single noncommissioned officers' quarters, contracted for in June, 1900, are not yet completed, the work having been delayed by failure of the first contractor to carry on the work. Work on 2 additional sets of officers' quarters (including 1 for field officer) was commenced in June, 1901.

Great Diamond Island, Me.—A barrack for 30 men and a temporary

building for stable, storehouse, etc., were built here during the year. Before the close of the year 111 acres of land were purchased as a site for permanent post.

Fort Heath, Mass.—A temporary barrack for 10 men was contracted for in June, 1901. Permanent construction work has not yet been started.

Fort H. G. Wright, N. Y.—A temporary barrack for 30 men was built in January, 1901. The following permanent buildings were placed under contract before the close of the fiscal year: A barrack for 120 men, 4 sets officers' quarters, a guardhouse, an administration building, a hospital, a hospital steward's quarters, 2 double sets non-commissioned officers' quarters, a quartermaster and subsistence storehouse, a bakehouse, stable, shop, coal shed, oil house, and ordnance storehouse.

Fort Howard, Md.—The construction of permanent post was begun in June, 1900, when 2 barracks for 100 men each, 6 single officers' quarters, and 10 other buildings were contracted for. On May 31, 1901, these buildings were reported completed. During the fiscal year 1901 a sewer system, a water system, a coal shed, and a shop building have been constructed. Grading work has been carried on and some permanent roads and walks constructed. In July, 1901, 2 additional sets of officers' quarters (including 1 set for a field officer) were contracted for, the cost to be defrayed from funds of the fiscal year 1901-1902.

Fort Lorton, Wash.—To complete this post for occupancy, a bakery, an administration building, a stable and wagon shed, a guardhouse, and a set of hospital stewards' quarters were placed under contract before the close of the fiscal year.

Fort Mansfield, R. I.—The above remarks under head of "Fort H. G. Wright" apply also to this post, except that at Fort Mansfield the barrack under construction will accommodate only 100 men, and a lavatory is included in list of buildings under contract at this post.

Fort McRee, Fla.—At this post the construction of a wharf, a barrack for 30 men, a single set of officers' quarters, and a storehouse was authorized in December, 1900, and the work is nearly completed.

Fort Miley, Cal.—The following buildings were contracted for in June, 1901, and are to be completed in April, 1902: One barrack for 100 men, 2 single and 1 double set officers' quarters, 2 double sets non-commissioned officers' quarters, a quartermaster and subsistence storehouse, a quartermaster's stable, a guardhouse, and an administration building.

Fort Monroe, Va.—The construction of a third story on barrack No. 5, to provide accommodations for six batteries of increased strength, begun in the preceding fiscal year, has been completed. The necessary sanitary improvements have been made during the year by the erection of bath houses, water-closets, etc., in connection with these barracks.

Fort Morgan, Ala.—At the close of the preceding fiscal year work on a barrack for 120 men, 2 lavatories, a mess hall, 2 single officers' quarters, and other buildings had been commenced. The contractor for these buildings failed to complete them by the time stipulated (February 28, 1901). A contract has been made with his bondsmen to complete same, and the work is now nearly completed. Contract was made in April, 1901, for an additional mess hall for one company.

Fort Pickens, Fla.—In May and June, 1900, contract was made for the erection at this post of a barrack for 120, a guardhouse, an

ordnance storehouse, an oil house, and a water and sewer system. The buildings were finished in November and the water and sewer system have since been completed. From funds of the fiscal year 1901 a lavatory and coal shed have been completed, porches built around officers' quarters, and an iron wharf contracted for.

Fort Preble, Me.—The sewer system, barrack for 100 men, double set of officers' quarters and other buildings, on which work was commenced in June, 1900, were all completed before the end of February, and in June, 1901, two additional sets of officers' quarters (one of them for a field officer) were placed under contract. (On August 2, 1901, instructions were given to invite proposals for a barrack for 110 men and a double set of officers' quarters, the cost of which will be defrayed from funds of the fiscal year 1902.)

Fort Revere, Mass.—A temporary barrack for 35 men was built here in January, 1901. In June, 1901, contract was executed for the construction of barrack for 110 men and the other permanent buildings enumerated under the head of "Fort H. G. Wright." These buildings are to be completed in May, 1902.

Fort Rodman, Mass.—A set of officers' quarters was completed here in May. A water system and sewer system are under construction. (On August 2, 1901, instructions were given to invite bids for a permanent barrack for 110 men and quarters for 2 officers, the cost to be defrayed from funds of the fiscal year 1902.)

Fort Screven, Ga.—Work on a barrack for 100 men, a lavatory, 2 detached mess halls with kitchens, 2 single officers' quarters, and a double set of noncommissioned officers' quarters was commenced at this post in June, 1900, and completed in April last. A building for quartermaster's and ordnance storehouse was contracted for in September, 1900, and completed in January, 1901.

Fort Stevens, Oreg.—The construction of a hospital, 2 lavatories, and outhouses for existing buildings was authorized and completed during the year. Work in connection with grading, roads, and walks was carried on. A water-distributing system was authorized in April, 1901, and is practically completed.

Fort Strong, Mass.—On November 12, 1900, the following buildings were placed under contract: Two double sets of officers' quarters, a stable, a bakery, a quartermaster's and subsistence storehouse, a double noncommissioned officers' quarters, a hospital, and a set of hospital steward's quarters. Work on same is still in progress. In April last contract was made for a barrack for 110 men to be completed in August, 1901.

Sullivan's Island, S. C.—The necessary land having been purchased, the construction of permanent buildings at this post was commenced in June, 1901, when contract was made for a double barrack for 240 men, 11 sets of officers' quarters, a hospital, 6 sets of noncommissioned officers' quarters, a set of steward's quarters, a stable, a guardhouse, a shop building, a coal shed, an oil house, a quartermaster's and subsistence storehouse, and an ordnance storehouse. The contract requires completion of these buildings by February 23, 1902.

Fort Terry, N. Y.—Work on this post was continued during the year. The construction of a double and single set of noncommissioned officers' quarters was authorized and completed, and a set of hospital steward's quarters has been contracted for. Title to 647 acres of land was secured before the end of the year. The construction of a sewer for the hospital has been authorized.

Fort Totten, N. Y.—The artillery barrack for 120 men, on which work was commenced in January, 1900, was completed in February last.

Fort Washington, Md.—In June, 1900, work was commenced on 2 barracks for 100 men each and 6 single sets of officers' quarters. One of these barracks and 2 of the 6 sets of officers' quarters were completed in March last. The contractor having failed to complete the other buildings, the work was taken out of his hands and is now in course of completion by his bondsmen. From funds of the fiscal year 1901 the construction of an administration building, a guardhouse, a quartermaster's stable, a single set of noncommissioned officers' quarters, a coal shed, an oil house, a boathouse, and a sewer system has been completed, and work on a 12-bed hospital and a bakery, the sinking of a 6-inch well, and the laying of water mains are in progress. (After the close of the fiscal year 2 single sets of officers' quarters, chargeable to funds of the fiscal year 1902, were contracted for.)

Fort Wetherill, R. I.—Work on this post was commenced by the erection of a barrack for 26 men, a double set of noncommissioned officers' quarters, and a temporary building for use as stable, storehouse, etc., all of which were completed in April last.

Fort Williams, Me.—The barrack for 100 men, double set of officers' quarters, double set of noncommissioned officers' quarters, and hospital, contracted for in June, 1900, were all completed on May 15, 1901. During the year a fence was built around the reservation, some grading done, and roads constructed. The temporary barracks, mess hall, and hospital were moved and converted into storehouses, etc. In June, 1901, 1 set of field officers' quarters and 2 sets of company officers' quarters were contracted for. (After the close of the fiscal year the construction of a brick barrack for 110 men was authorized, the cost of same to be defrayed from funds of the fiscal year 1902.)

CONSTRUCTION AT INTERIOR POSTS AND DEPOTS.

As shown in the foregoing table, under the head of "Special military posts appropriations," the following work was authorized during the year:

At Fort D. A. Russell, the construction of 3 double officers' quarters and a guardhouse; at Fort Leavenworth, 1 addition each to barracks Nos. 47, 48, and 49; at Fort Lincoln (near Bismarck, N. Dak.), a water and sewer system; at Fort Meade, a barrack for 100 men, a guardhouse and other buildings, and at Fort Riley, 2 artillery stables for 70 horses each. Work at Fort Meade was commenced in November and at Fort D. A. Russell in December last, and at the other posts named before the close of the fiscal year. At Fort Riley 4 hay sheds are also under construction, the cost being defrayed from the appropriation for regular supplies. At Fort Leavenworth, besides the additions to barracks, a storehouse, a building for light battery guardroom, etc., and a sewer for the hospital are under construction.

In addition to the above, there were important building operations during the year at Fort Mackenzie, Wyo., Jefferson Barracks, West Point, and at the Jeffersonville and Philadelphia depots, as indicated below:

Fort Mackenzie (Sheridan), Wyo.—By special act of Congress approved April 7, 1900, the Secretary of War was "authorized and directed to complete the establishment and erection of a military post

near the city of Sheridan, in the State of Wyoming," and \$100,000 was appropriated for "continuing the work of constructing the necessary buildings, quarters, barracks, and stables for the post established under the provisions of this bill." The construction of buildings, chargeable to this appropriation, was commenced in October, 1900, the cost of construction proper and plumbing being charged to the special appropriation, and the cost of heating and electric wiring to the appropriation for regular supplies. The buildings and contract prices are as follows:

1 barrack for 100 men.....	\$26,683
Plumbing.....	2,355
Heating.....	2,216
Electric wiring.....	1,220
2 double sets officers' quarters.....	26,860
Plumbing.....	2,801
Heating.....	2,940
Electric wiring.....	880
Guardhouse.....	5,294
Plumbing.....	396
Heating.....	516
Electric wiring.....	100
Hospital.....	10,561
Plumbing.....	846
Heating.....	1,382
Wiring.....	440
Hospital stewards' quarters.....	3,583
Plumbing.....	249
Electric wiring.....	110
Quartermaster's and subsistence storehouse.....	13,732
1 double set noncommissioned officers' quarters.....	4,011
Plumbing.....	510
Electric wiring.....	200
Coal shed.....	1,641
Total.....	109,526

The cost of construction and plumbing as above noted amounts to \$99,522. Sixty-one dollars was also allotted for extra work on barracks and quarters, leaving a balance from the special appropriation of approximately \$417 to cover cost of printing, advertising, etc.

Jefferson Barracks, Mo.—In June, 1900, large contracts were made for grading, work on roads, sewers, and water system, and the construction of an administration building, addition to storehouse, etc. This work was completed in December last, except repairs to roads, for which it was necessary to make a new contract. An ordnance storehouse was built from funds of the fiscal year 1900.

West Point, N. Y. (Military Academy).—At the army post here the renovation of barracks was authorized and was completed in January, 1901. In September, 1900, three double sets of officers' quarters were contracted for. Work on same is nearly completed.

Jeffersonville Depot, Ind.—An additional storehouse for this general depot and certain alterations and improvements in the old buildings were placed under contract in December, 1900, and completed in April last. In June, 1901, contract was made for power house, boilers, tank, trestle, etc., in connection with water system.

Philadelphia Depot, Pa.—In the act making appropriation for sundry civil expenses of the Government for the fiscal year ending June 30, 1901, under the head of Schuylkill Arsenal, Congress appropriated \$16,000 for "roofing over and putting floors in the courtyard of the

present No. 3 fireproof building, to provide storage and boxing and shipping space;" also \$6,000 "for rearrangement of the inspecting and issuing department." This work was commenced in September, 1900, and was nearly completed at the close of the fiscal year. Among other improvements authorized at this depot during the year were the extension of arsenal walls, placing of elevator in new warehouse, the installation of an electric storage battery, and the tearing down and rebuilding on new site of iron shed B. The cost of these additional improvements was defrayed from the general appropriations of the Quartermaster's Department.

GENERAL HOSPITALS.

The improvements made at the Army and Navy General Hospital, Hot Springs, Ark., are shown in the foregoing statement, under the head of "Construction of buildings for hospitals and hospital stewards' quarters."

The buildings at the Josiah Simpson General Hospital (near Fort Monroe, Va.), after inspection, were on September 15, 1900, ordered to be sold. The buildings, etc., were accordingly sold, and the lease of hospital site was relinquished on December 31, 1900. A portion of the plumbing material and other fixtures were shipped to the St. Asaph depot. The sum of \$6,728.30 was deposited in the Treasury as proceeds of sale.

At the Fort Bayard (N. Mex.) General Hospital the work of repairing buildings was completed and other improvements made. From the appropriation for hospitals a solarium was placed under contract and repairs authorized on other buildings amounting to \$15,849.64; repairs were authorized from barracks and quarters funds amounting to \$24,798.41; a boiler and pump house was completed in December, 1900, the cost being charged to the appropriation for Army transportation, \$1,935; total, \$42,583.05.

At the Presidio of San Francisco General Hospital a contract was made on March 11, 1901, for a chapel and reading room, including heating and wiring, which has been completed, at cost of \$3,405. On June 24, 1901, a contract was made for the construction, plumbing, and wiring of 1 commanding officers' and 1 double set of officers' quarters, amounting to \$27,945.41. On June 10, 1901, a fire occurred which destroyed some of the hospital buildings, the loss being estimated at \$50,000. From funds of the fiscal year 1901 the reconstruction of kitchen was authorized, the cost of same, with fixtures, being \$14,319.50. Minor items of construction work authorized during the year amounted to approximately \$5,275.60; total, \$50,945.51.

(After the close of the fiscal year the reconstruction of other buildings was authorized, the cost to be charged to funds of the fiscal year 1902.)

CHINA, PORTO RICO, ALASKA, AND THE PHILIPPINES.

Funds have been remitted and material purchased in the United States for shelter of troops in China and in the territories indicated above, but office records relative thereto are comparatively incomplete. It has not been found practicable to allot funds for specific buildings, and in most cases the cost of each building erected has not been reported to this office. No barracks and quarters funds were expended in Cuba during the year.

CHINA.

In August and September, 1900, a total of 3,746,120 feet of lumber and other materials were ordered purchased in Seattle for flooring tents, mess shacks, etc., and for constructing stables and storehouses in China. These materials were purchased and shipped, but instructions were given to send such portion of same as might not be required in China to Manila, and it appears from later report received in this office that only 277,935 feet of lumber and 71 kegs of nails from these shipments were retained in China.

The approximate cost of same was	\$2, 934. 00
Building materials and tools were also purchased in San Francisco at cost of	6, 105. 95

Carpenters were hired and sent to China to erect the buildings above referred to, but the length of time they were employed, the total wages paid them, and the buildings erected (if any) have not been reported to this office.

During the year there was remitted for construction including barracks and quarters for legation guard in Pekin.....	60, 000. 00
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Total for barracks and quarters appropriation	69, 039. 95
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Sterilizers and water-distilling plants were purchased in July, 1900, and shipped to China at a cost of \$23,715, defrayed from the appropriation for incidental expenses.

ALASKA.

In the early part of the fiscal year funds were remitted to posts in Alaska for material and labor for construction of buildings, as follows:

Fort St. Michael, hire of labor.....	\$48, 000. 00
Fort Davis (Cape Nome), hire of labor	40, 651. 00
Fort Liscum (Port Valdez), hire of labor.....	24, 775. 00
Fort Gibbon:	
Hire of labor.....	\$21, 717. 50
Saw logs	40, 000. 00
	61, 717. 50
Skagway, "emergencies".....	1, 000. 00
Fort Egbert:	
Hire of labor.....	\$12, 395. 00
Saw logs	12, 605. 00
	25, 000. 00
In excess of estimates, remitted	10, 000. 00
Total	211, 143. 50

(There was also remitted at the same time for rent of buildings at Fort St. Michael \$8,000 and for rents at Skagway \$2,250, making a total of \$221,393.50 remitted on September 26, 1900, and prior to that date.)

The following additional allotments were made during the year from the appropriation for barracks and quarters:

Fort Egbert, sawmill fixtures and tools.....	\$3, 021. 12
Fort Gibbon, parts for sawmill, etc.....	3, 478. 44
Fort Davis, labor and material for coal shed, and other building material.....	1, 837. 74
Fort St. Michael:	
Material for quartermaster's and subsistence storehouse.....	\$10, 151. 10
Labor for same.....	24, 000. 00
Material for employees' quarters.....	1, 740. 86
Material for other purposes.....	3, 411. 50
	39, 303. 46
Fort Liscum:	
Corrugated iron and other material to complete buildings.....	3, 159. 20
Miscellaneous	2, 503. 19

Total from barracks and quarters funds for construction and repair.....	264, 446. 65
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FORT LISCUM.

A report has been received of building operations at Fort Liscum, from which it appears that the total expenditures from barracks and quarters funds during the year for material and labor at this post was \$17,146.29, a saving from the \$24,775 remitted of \$7,628.71.

The post is practically completed, 22 buildings having been erected, including barracks (capacity not reported), 4 sets officers' quarters, hospital, 1 set noncommissioned officers' quarters, stable, storehouses, etc.

The army appropriation act of May 26, 1900, provided that \$100,000 of the appropriation for army transportation "may be used in Alaska and shall be immediately available for the construction of military roads and bridges." In accordance therewith on July 6, 1900, \$32,000 of this amount was remitted to Captain Abercrombie to continue the work of constructing the road from Valdez to the Yukon River, and the balance to the department chief quartermaster. No reports have been received showing work done under this special appropriation. The act approved March 2, 1901, extended the appropriation, so as to make the balance unexpended on June 30, 1901, available in the next fiscal year.

PHILIPPINE ISLANDS.

Under office orders of January 18 and March 14, 1901, the chief quartermaster at Vancouver Barracks purchased and shipped to Manila about 2,750,000 feet of fir lumber and 500,000 feet of cedar. There was also shipped from Seattle to Manila about 3,474,000 feet of lumber and other building materials originally purchased for China. In August, 1900, large quantities of tools, hardware, corrugated iron, etc., for building purposes, and in June, 1901, a large amount of white lead and linseed oil was purchased in New York and shipped to Manila for building purposes. The total cost of building materials purchased and shipped from the United States from barracks and quarters funds of the fiscal year 1900-1901 was, approximately, \$127,789.27.

The Secretary of War having directed that the use of insular revenues for purely military purposes should cease on April 1, 1901, there has been expended by the chief quartermaster, division of the Philippines, since that date, in addition to rentals, the following amounts from the barracks and quarters appropriation:

Department of Northern Luzon:		
Construction	\$65, 130. 86	
Repairs.....	37, 295. 39	
		\$102, 426. 25
Department of Southern Luzon:		
Construction	10, 542. 72	
Repairs.....	282. 02	
		10, 824. 74
Department of Visayas:		
Construction	13, 748. 69	
		13, 748. 69
Department of Mindanao and Jolo:		
Construction	3, 774. 92	
Repairs.....	5, 781. 84	
		9, 556. 76
Total barracks and quarters funds.		264, 345. 71

The following expenditures are of record as having been made for purchase of articles in this country and for hire of labor in the Philip-

piners in connection with water supply, condensing plants for odorless excavators, etc.:

Incidental expenses	\$24, 782. 14
Army transportation	32, 020. 01

The following remarks on shelter for troops in the Philippines are taken from report of the division chief quartermaster for the past fiscal year:

Manila.—The troops in Manila during the past year have been quartered in (1) Spanish cuartels; (2) convents; (3) rented buildings. (Of the cuartels, there are four which will accommodate about 1,850 men.)

One or two convent buildings have been used for troops as barracks, where there were no other buildings in the vicinity suitable for the purpose. These have now been given up.

Rented buildings at the present time have been almost entirely given up, and the companies or detachments which were quartered therein withdrawn and located in the various cuartels. These buildings were private residences, and were hired as an emergency in order to provide shelter for troops in special parts of the city. A number of these houses are now used as stations by the civil police.

Three wooden buildings were constructed in Malate for use of troops. These buildings afford barracks, dining room, and kitchen for two companies of infantry.

A two-story frame building for officers' quarters was erected at cuartel de Meisic, which has greatly improved the post and added to the comfort of the garrison. Mess sheds have also been erected here sufficient to accommodate the entire enlisted force.

The Pasay Barracks, situated just south of Manila on the bay and under the orders of the commanding general, Department of Southern Luzon, were completed two years ago. They are built of nipa and have barracks, officers' quarters, and stables sufficient for a regiment of cavalry.

Departments of northern and southern Luzon.—Outside of Manila there are no public buildings belonging to the War Department. In some of the more important towns there is a municipal building or two that has been taken possession of temporarily by the troops; but it is believed they have all been vacated. The troops in these two departments are quartered in such buildings as can be obtained in towns where located. Almost every town has a church and a large building connected with it called a convent, where the priests live. In almost every instance these buildings have been found vacant when our troops entered, the town having been occupied by the insurgents. The convents being the largest and most suitable buildings, they have been used as hospitals and barracks for the troops, the lower story being used for stores. In many cases these buildings were the only ones at all suitable for the hospitals or storehouses for rations and other perishable goods. No rent has been paid for any of these convents for the reason that the ownership has not been satisfactorily proven. Whenever the ownership of buildings occupied for military purposes has been proven and the owner has taken the oath of allegiance in good faith and has remained friendly to the United States, rent has been paid from the date the owner took the oath of allegiance. Usually the number of buildings required and rent paid is determined by the recommendation of a board of officers.

In some cases temporary storehouses have been built and in many places stables for the animals have been constructed, the material in the latter usually being nipa and bamboo, with sufficient American lumber to construct the hay racks and feed boxes. In none of the towns is there any water supply or sewer system. The water used by the troops has always been boiled, distilled, or sterilized. The dry-earth system of closets has been used almost exclusively for the men's closets.

Department of Mindanao and Jolo.—The public buildings in the department when the troops took possession of them were in very poor condition. No repairs have been made by the Spanish Government for many years, and upon the departure of the Spanish troops the insurgents looted them, tearing out doors, windows, moving roofs, and, in fact, carrying off everything that it was possible to move.

Department of the Visayas.—Most of the troops in this department have been provided quarters in private houses or public buildings (tribunals, convents, etc.) in the town occupied, as the military necessities required, and where it was shown that the owners of the buildings occupied were loyal citizens they have been allowed rental therefor.

Some few temporary buildings have been erected—kitchens, corral sheds, stables, etc.—most of them of nipa and bamboo construction, and at several stations officers' quarters and barrack buildings have been built.

The water supply at most of the stations is obtained from wells, storage tanks for rain water, or from springs. At Iloilo and Cebu distilling plants are in operation, and Waterhouse Forbes sterilizers have been provided at all stations requiring them. When suitable water could not otherwise be provided, water boilers have been supplied the troops with which to boil water used for drinking.

PORTO RICO.

The following allotments from the appropriation for barracks and quarters have been made during the year for construction and repair work:

Purchase in New York of nails, paints, and other building material for shipment to Porto Rico, amounting to approximately.....	\$10,855.55
Mayaguez. Repairs.....	3,500.00
Ponce. Construction of quarters for commanding officer and 7 company officers, including plumbing.....	1,395.46
Ponce. General repairs.....	5,603.77
San Juan. Construction of buildings.....	10,575.61
Repairs to department headquarters and post buildings.....	18,559.59
Cayey (Henry Barracks). Tearing down sheds, stables, shops, etc., at San Juan depot, and reconstructing same into barracks, etc., at this post; construction of three saddle rooms, and labor in erecting commissary storehouse.....	3,479.61
Total barracks and quarters funds.....	53,967.59

A total of \$12,221.12 was also expended from army transportation funds for grading, work on roads, walks, water and sewer systems, etc., in Porto Rico; also \$1,700, incidental expenses funds, for hose, sterilizers, etc. From the appropriation for regular supplies a bakery was erected at San Juan at cost of \$1,955.

Recapitulation of expenditures from barracks and quarters appropriation.

China.....	\$69,039.95
Alaska.....	264,446.65
Philippine Islands.....	264,345.71
Porto Rico.....	53,967.59
Total.....	651,799.90

TARGET FUNDS.

"For shelter, shooting galleries, ranges for small arms, target practice, repairs, and expenses incident thereto," Congress in the act making appropriations for the support of the Army for the fiscal year ending June 30, 1901, appropriated \$10,000.

The total amount authorized for rent, repairs, and construction in each department is shown in the following statement:

Department.	Amount.
Department of the East.....	\$2,881.57
Department of the Lakes.....	365.00
Department of Texas.....	205.00
Department of the Missouri.....	3,689.78
Department of Dakota.....	1,574.88
Department of the Colorado.....	423.97
Department of California.....	409.00
Department of the Columbia.....	270.80
Balance unexpended.....	180.00
Total.....	10,000.00

BOX LOCKERS.

At the beginning of the fiscal year the number of box lockers in stock at Jeffersonville depot available for issue to troops was..... 3,764
There were also available for issue at other points..... 4,824

During the year, lockers were purchased or delivered at the following places, the cost being charged to the appropriation for incidental expenses:

Jeffersonville depot (\$2 each).....	5,781
Vancouver Barracks (at \$1.85 each).....	1,384
New York depot, N. Y. (\$1.95 each).....	1,000
San Francisco depot (at \$1.84 each).....	432
Fort Meade, S. Dak., (at \$1.85 each).....	1,175
Presidio of San Francisco, (at \$2.27 each).....	248
Fort Wright, Wash., (at \$1.75 each).....	40
Denver, Col., (at \$1.60 each).....	20
Turned in by troops.....	60

Total.....	18,708
The total number issued to troops during the year under orders from this office was.....	13,297

Balance available June 30, 1901.....	5,411
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Of these, 3,248 are in stock at Jeffersonville depot, and the remainder at other depots and posts.

FLAGSTAFFS.

At the beginning of the year three 100-foot iron flagstuffs were in stock at the St. Louis depot. There were purchased, under contract, during the year nine 100-foot and twelve 75-foot iron flagstuffs. Staffs were shipped for erection at posts as follows:

Fort Wadsworth, N. Y., Fort Howard, Md., Fort Huachuca, Ariz., Fort Meade, S. Dak., Fort Yellowstone, Wyo., one 100-foot each; Fort Pickens, Fla., and Fort Wingate, N. Mex., one 75-foot staff each. This left available at end of year seven 100-foot and ten 75-foot flagstuffs.

Flagstuffs of various designs were also erected at the following posts:

Fort Davis, Alaska, Fort Wetherill, R. I., Fort Walla Walla, Wash., Fort Meade, S. Dak., Fort Huachuca, Ariz., Fort Strong, Mass., Fort Fremont, S. C., Fort Stevens, Oreg., Fort Howard, Md., camp near Port Valdez, and Fort St. Michael, Alaska.

The cost of all flagstuffs, including foundations and erection of same, was defrayed from the appropriation for incidental expenses.

ROAD AT THE PRESIDIO, CALIFORNIA (SPECIAL APPROPRIATION).

In special act of Congress approved June 6, 1900, Congress appropriated \$5,000 for continuing work on road to national cemetery. Expenditures from this fund have been reported as follows:

Construction of 843½ feet of wall.....	\$4,554.00
Advertising and pay of inspector and engineer.....	445.79
Total.....	4,999.79

The length of wall yet to be constructed is reported to be 11,850 feet.

LOSSES BY FIRE.

The following statement shows damage to buildings by fire in the past year:

Post.	Buildings.	Amount of damage.
Fort Greble, R. I	Bakery.....	Damaged.
Fort Yates, N. Dak	Quartermaster's stable.....	Destroyed.
	Ice house.....	Do.
Fort Assiniboine, Mont.....	Commanding officer's quarters.....	Damaged \$2,700.
Fort Adams, R. I	Hospital steward's quarters.....	Damaged \$90.
Fort Thomas, Ky	Ferry house.....	Damaged \$87.
	Bachelor officers' quarters.....	Damaged \$40.
Fort Leavenworth, Kans.....	Officers' quarters.....	Damaged \$313.
	Cavalry barracks.....	Damaged \$510.
Fort Keogh, Mont.....	Cavalry barracks.....	Damaged \$682.
Fort Mott, N. J	Temporary barracks.....	Damaged \$50.
Fort Myer, Va.....	Hospital.....	Damaged \$687.
Camp Merritt, Mont.....	Barracks.....	Damaged \$25.
	Bakery.....	Destroyed.
Fort Gibbon, Alaska.....	Officers' quarters.....	Do.
	Bakery, etc.....	Do.
Fort Sam Houston, Tex	Cavalry blacksmith shop.....	Do.
Presidio of San Francisco, Cal.....	General hospital.....	Damaged \$50,000.
Fort Snelling, Minn.....	Noncommissioned staff quarters.....	Damaged beyond repair.

Very respectfully,

M. C. MARTIN,
Major and Quartermaster, United States Army.

The QUARTERMASTER-GENERAL.

APPENDIX A.—Hire of employees defrayed from the appropriation for "Barracks and quarters, 1900-1901," and not covered by allotments for specific construction and repair work.

Post or station.	Character of services.	Monthly rate of pay.	Total for the year.
Governors Island, N. Y.....	1 carpenter.....	\$75.00	\$900.00
Fort Myer, Va.....	do.....	60.00	180.00
Fort Screven, Ga.....	1 master carpenter.....	100.00	1,200.00
Fort Wood, N. Y.....	1 carpenter.....	75.00	900.00
Fort Monroe, Va.....	1 superintendent of construction.....	125.00	954.16
Presidio of San Francisco, Cal.....	1 carpenter.....	60.00	266.00
Model Camp.....	do.....	80.00	400.00
Presidio of San Francisco, general hospital.....	do.....	60.00	720.00
Honolulu, H. I.....	1 tinner and roofer.....	80.00	717.33
	1 carpenter.....	90.00	813.00
Fort Washington, Md., and Fort Hunt, Va.....	Assistant to superintendent of construction.....	50.00	350.00
Fort Delaware, Del.....	1 master carpenter.....	100.00	840.00
Columbus Barracks, Ohio.....	1 superintendent of construction.....	100.00	200.00
Fort Sheridan, Ill.....	1 carpenter.....	60.00	220.00
San Francisco depot.....	1 carpenter and inspector.....	90.00	1,080.00
Fort Crook, Nebr.....	1 carpenter.....	75.00	225.00
New York (Army Building).....	do.....	85.00	1,020.00
Fort Meade, S. Dak.....	1 engineer in charge of sawmill.....	83.33	999.96
Seattle and Tacoma, Wash.....	Lumber inspector.....	100.00	140.00
Do.....	do.....	150.00	1,100.00
Total.....			13,225.45

APPENDIX B.—Property hired by the Quartermaster's Department for the recruiting service and the amount of rent paid therefor.

DEPARTMENT OF THE EAST.

Place where rented.	Kind of property and number of rooms.	Purpose for which used.	Monthly rate of rent.	Total amount for the year.
Birmingham, Ala.....	3 rooms.....	Recruiting station.....	\$60.00	\$780.00
Elmira, N. Y.....	4 rooms.....	do.....	46.00	245.33
Hartford, Conn.....	1 room.....	do.....	19.00	228.00
Macon, Ga.....	3 rooms.....	do.....	25.00	300.00
Savannah, Ga.....	1 room.....	do.....	40.00	480.00
Mobile, Ala.....	3 rooms.....	do.....	40.00	186.67
Bridgeport, Conn.....	2 rooms.....	do.....	20.00	240.00
New Haven, Conn.....	do.....	do.....	45.00	540.00
New Orleans, La.....	20 rooms.....	do.....	100.00	475.00
Providence, R. I.....	2 rooms.....	do.....	30.00	360.00
Worcester, Mass.....	3 rooms.....	do.....	30.00	360.00
New Bedford, Mass.....	2 rooms.....	do.....	30.00	360.00
Fall River, Mass.....	1 room.....	do.....	27.00	324.00
Rochester, N. Y.....	5 rooms.....	do.....	65.00	780.00
Springfield, Mass.....	1 room.....	do.....	50.00	600.00
Syracuse, N. Y.....	5 rooms.....	do.....	55.00	660.00
Utica, N. Y.....	2 rooms.....	do.....	25.00	300.00
Geneva, N. Y.....	do.....	do.....	24.00	288.00
Boston, Mass:				
35 Kneeland street.....	3 floors.....	do.....	60.00	220.00
73 Hanover street.....	4 rooms.....	do.....	92.50	1,110.00
239 Friend street.....	2 rooms.....	do.....	30.00	121.00
1125 Washington street.....	5 rooms.....	do.....	90.00	810.00
Savannah, Ga.....	3 rooms.....	do.....	40.00	120.00
Portland, Me.....	do.....	do.....	16.00	196.00
Bangor, Me.....	2 rooms.....	do.....	21.00	121.40
Baltimore, Md.....	9 rooms.....	do.....	30.00	340.00
Charlotte, N. C.....	2 rooms.....	do.....	16.00	192.00
Asheville, N. C.....	do.....	do.....	18.00	76.75
Goldsboro, N. C.....	3 rooms.....	do.....	30.00	142.00
Greensboro, N. C.....	2 rooms.....	do.....	17.50	210.00
Roanoke, Va.....	Furnished office.....	do.....	43.95	205.10
Richmond, Va.....	8 rooms and bath.....	do.....	35.00	186.67
Albany, N. Y.....	6 rooms.....	do.....	40.00	480.00
Brooklyn, N. Y.....	4 rooms.....	do.....	40.00	557.00
Buffalo, N. Y.....	6 rooms.....	do.....	47.00	720.00
Newark, N. J.....	8 rooms.....	do.....	60.00	563.75
Jersey City, N. J.....	4 rooms.....	do.....	40.00	215.75
do.....	2 rooms.....	do.....	25.00	17.00
Now York City:				
No. 25 Third avenue.....	14 rooms.....	do.....	130.00	1,560.00
182 Park avenue.....	1 room.....	do.....	50.00	1,066.70
741 Sixth avenue.....	9 rooms.....	do.....	60.00	960.00
57 East 125th street.....	7 rooms.....	do.....	80.00	251.20
Paterson, N. J.....	9 rooms.....	Recruiting station.....	30.00	960.00
Philadelphia, Pa.....	2 rooms.....	do.....	20.00	220.00
Pittsburg, Pa.....	10 rooms.....	do.....	75.00	900.00
Do.....	1 room.....	do.....	30.00	260.00
Harrisburg, Pa.....	5 rooms.....	do.....	55.00	605.00
Do.....	1 room.....	do.....	20.00	180.00
Williamsport, Pa.....	2 rooms.....	do.....	18.00	108.00
Do.....	3 rooms.....	do.....	20.00	100.00
Scranton, Pa.....	2 rooms.....	do.....	20.00	151.33
Lancaster, Pa.....	1 room.....	do.....	16.00	112.00
Various points.....		Temporary stations and lodgings.....		13,540.91
Total.....				35,069.96

DEPARTMENT OF THE LAKES.

Chicago, Ill.:				
82 West Madison street.....	Building.....	Recruiting station.....	\$82.00	\$984.00
426 State street.....	do.....	do.....	60.00	720.00
15 South Clark street.....	do.....	do.....	100.00	590.00
Peoria, Ill.....	do.....	do.....	22.00	264.00
Rockford, Ill.....	1 room.....	do.....	15.00	15.00
Do.....	do.....	do.....	27.50	165.00
Do.....	do.....	do.....	27.00	185.00

APPENDIX B.—Property hired by the Quartermaster's Department for the recruiting service and the amount of money paid therefor—Continued.

DEPARTMENT OF THE LAKES—Continued.

Place where rented.	Kind of property and number of rooms.	Purpose for which used.	Monthly rate of rent.	Total amount for the year.
Springfield, Ill.	Building	Recruiting station	\$20.00	\$240.00
Evansville, Ind.	do	do	50.41	604.92
Indianapolis, Ind.	do	do	60.00	600.00
South Bend, Ind.	do	do	50.00	225.00
Lexington, Ky	do	do	45.00	540.00
Louisville, Ky	do	do	65.00	780.00
Detroit, Mich.	do	do	75.00	900.00
Grand Rapids, Mich.	do	do	50.00	600.00
Canton, Ohio	1 room	do	35.00	290.00
Cincinnati, Ohio	Building	do	72.00	864.00
Cleveland, Ohio	do	do	93.00	1,116.00
Columbus, Ohio	3 rooms	do	25.00	245.00
	5 rooms	do	25.00	
Dayton, Ohio	Building	do	40.00	480.00
Toledo, Ohio	do	do	50.00	600.00
Youngstown, Ohio	3 rooms	do	45.00	540.00
Chattanooga, Tenn.	Building	do	25.00	300.00
Knoxville, Tenn.	do	do	25.00	300.00
Memphis, Tenn.	do	do	25.00	360.00
Nashville, Tenn.	do	do	50.00	600.00
Wheeling, W. Va.	2 rooms	do	35.00	168.00
Milwaukee, Wis.	Building	do	56.00	560.00
Various points	Building	Temporary stations and lodgings		6,771.36
Total				20,547.28

DEPARTMENT OF TEXAS.

Dallas, Tex.	3 rooms	Recruiting station	\$34.00	\$408.00
Houston, Tex.	do	do	43.00	321.00
Fort Worth, Tex.	1 room	do	15.00	131.60
Galveston, Tex.	do	do	15.00	134.00
Various points		Temporary stations and lodgings		1,714.00
Total				2,708.60

DEPARTMENT OF THE MISSOURI.

Davenport, Iowa	1 room	Recruiting station	\$15.00	\$180.00
Des Moines, Iowa	5 rooms	do	50.00	600.00
Dubuque, Iowa	2 rooms	do	18.00	86.40
Topeka, Kans.	do	do	24.00	248.00
Wichita, Kans.	1 room	do	30.00	300.00
Kansas City, Kans.	8 rooms	do	60.00	720.00
St. Joseph, Mo.	1 room	do	30.00	210.00
Omaha, Nebr.	6 rooms	do	65.00	333.50
Little Rock, Ark.	3 rooms	do	28.50	228.00
St. Louis, Mo.	5 rooms	Dormitory	45.00	540.00
Various points		Temporary stations and lodgings		3,980.70
Total				7,426.60

DEPARTMENT OF DAKOTA.

St. Paul, Minn.	7 rooms	Recruiting station	\$51.50	\$618.00
Minneapolis, Minn.	10 rooms	do	50.66	607.92
Various points		Temporary stations and lodgings		220.25
Total				1,456.17

DEPARTMENT OF THE COLORADO.

Cheyenne, Wyo.	2 rooms	Recruiting station	\$25.00	\$262.50
Denver, Colo.	3 rooms	do	45.00	540.00
Pueblo, Colo.	2 rooms	do	25.00	300.00
Various points		Temporary stations and lodgings		5,361.83
Total				6,464.33

APPENDIX B.—*Property hired by the Quartermaster's Department for the recruiting service and the amount of rent paid therefor—Continued.*

DEPARTMENT OF CALIFORNIA.

Place where rented.	Kind of property and number of rooms.	Purpose for which used.	Monthly rate of rent.	Total amount for the year.
San Francisco, Cal.....	7 rooms.....	Recruiting station	\$75.00	\$900.00
Los Angeles, Cal.....	3 rooms.....	do	25.00	116.65
Various points.....	.....	Temporary stations and lodgings.....		828.97
Total				1,845.62

DEPARTMENT OF THE COLUMBIA.

Seattle, Wash	3 rooms.....	Recruiting station	\$45.00	\$540.00
Portland, Oreg	5 rooms.....	do	43.00	516.00
Various points.....	.....	Temporary stations and lodgings.....		1,069.52
Total				2,125.52

RECAPITULATION.

Department of the East.....	\$35,069.96
Department of the Lakes.....	20,547.28
Department of Texas.....	2,708.60
Department of the Missouri.....	7,426.60
Department of Dakota.....	1,456.17
Department of the Colorado.....	6,464.33
Department of California.....	1,845.62
Department of the Columbia.....	2,125.52
Total	77,644.08

APPENDIX C.—*Property rented by the Quartermaster's Department for use as offices, storehouses, barracks, quarters, etc., during the fiscal year, and the amount of rent paid therefor.*

DEPARTMENT OF THE EAST.

Post or station.	Kind of property and number of rooms.	Purpose for which used.	Monthly rate of rent.	Total amount for year.
Fort Armistead, Md....	1 room.....	Quarters for ordnance sergeant.....	\$5.00	\$10.00
do	do	Quarters for electrician sergeant.....	5.00	6.50
Atlanta, Ga.....	2 rooms.....	Office paymaster	40.00	480.00
Fort Banks, Mass.....	1 room.....	Quarters for commissary sergeant	12.00	72.00
Fort Caswell, N. C.....	do	Quarters for hospital steward.....	7.00	66.50
do	do	Quarters for post quartermaster sergeant.....	8.00	88.80
do	do	Quarters for electrician sergeant.....	8.00	76.80
do	do	Quarters for ordnance sergeant.....	8.80	85.50
do	do	Quarters for commissary sergeant.....	8.80	37.00
Fort DuPont, Del.....	3 rooms.....	Quarters for major.....	30.00	352.00
do	2 rooms.....	Quarters for lieutenant.....	20.00	240.00
do	do	Quarters for 2 acting assistant surgeons.....	20.00	270.67
do	1 room.....	Quarters for commissary sergeant.....	12.00	100.00
do	do	Quarters for post quartermaster sergeant.....	10.00	88.33
do	do	Quarters for electrician sergeant.....	10.00	43.33
do	do	Quarters for ordnance sergeant.....	10.42	31.26
Great Diamond Island, Maine.....	do	Quarters for post quartermaster sergeant.....	12.00	40.00
Fort Hamilton, N. Y.....	do	Quarters for electrician sergeant.....	10.00	17.67
Fort Howard, Md.....	1 room.....	Quarters for commissary sergeant	7.00	42.00
Fort Hunt, Va.....	do	Quarters for electrician sergeant.....	12.00	6.00
Fort Mansfield, R. I.....	do	General hospital	41.66	291.62
Fort Monroe, Va.....	Land	Quarters for acting assistant surgeon.....	24.00	92.00
Fort Mott, N. J.....	2 rooms.....	Quarters for electrician sergeant.....	10.00	40.00
do	1 room.....	Quarters for hospital steward.....	10.00	40.00
do	do	For quartermaster and commissary departments.....	88.33	1,000.00
New Orleans, La.....	Offices.....	do	100.00	686.67
do	Storehouse	do		

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APPENDIX C.—Property rented by the Quartermaster's Department for use as offices, storehouses, barracks, quarters, etc.—Continued.

DEPARTMENT OF THE EAST—Continued.

Post or station.	Kind of property and number of rooms.	Purpose for which used.	Monthly rate of rent.	Total amount for year.
Fort Porter, N. Y. (For Pan-American Exposition, Buffalo.)	Rooms.....	Quarters for officers and enlisted men at exposition.	¹ \$12.00	\$403.60
Sullivan's Island, S. C.	Building.....	Administration building.....	36.00	432.00
	.....do.....	Offices, etc.....	36.00	432.00
	.....do.....	Quarters for colonel.....	60.00	514.00
	.....do.....	Quarters for major.....	48.00	361.60
	3 rooms.....	Quarters for 3 captains.....	36.00	931.20
	2 rooms.....	Quarters for 4 lieutenants.....	24.00	1,108.00
	1 room.....	Quarters for 9 noncommissioned officers.....	12.00	864.00
Tampa, Fla.....	Office.....	Quartermaster's agent.....	5.75	69.00
Fort Williams, Me.....	4 rooms.....	Quarters for commissary sergeant.....	¹ 12.00	144.00
	.....do.....	Quarters for ordnance sergeant.....	¹ 12.00	144.00
	.....do.....	Quarters for electrician sergeant.....	¹ 12.00	144.00
Alexandria, Va.....	1 room.....	Office for constructing quartermaster.....	30.00	30.00
Boston, Mass.....	Building.....	Offices and storerooms.....	458.33	5,499.96
	.....do.....	Clothing storehouse.....	100.00	850.00
	9 rooms.....	Officers' quarters.....	84.00	360.00
Delaware City, Del.....	2 rooms.....	Office constructing quartermaster.....	30.00	360.00
Baltimore, Md.....	.....do.....	Office depot quartermaster.....	70.00	620.00
Rochester, N. Y.....	6 rooms.....	Officers' quarters.....	72.00	288.00
Syracuse, N. Y.....	3 rooms.....	.....do.....	36.00	144.00
Mobile, Ala.....	2 rooms.....	.....do.....	24.00	72.00
Hartford, Conn.....	.....do.....	.....do.....	24.00	120.00
Fall River, Mass.....	3 rooms.....	.....do.....	36.00	180.00
Portland, Me.....	.....do.....	.....do.....	36.00	144.00
Montgomery, Ala.....	2 rooms.....	.....do.....	24.00	96.00
Savannah, Ga.....	3 rooms.....	.....do.....	36.00	144.00
New Haven, Conn.....	.....do.....	.....do.....	36.00	144.00
Elmira, N. Y.....	.....do.....	.....do.....	36.00	108.00
Springfield, Mass.....	.....do.....	.....do.....	36.00	108.00
Philadelphia, Pa.....	4 rooms.....	.....do.....	48.00	192.00
	.....do.....	.....do.....	48.00	48.00
	3 rooms.....	.....do.....	36.00	180.00
Pittsburg, Pa.....	.....do.....	.....do.....	36.00	144.00
	4 rooms.....	.....do.....	48.00	48.00
Williamsport, Pa.....	2 rooms.....	.....do.....	24.00	59.20
Harrisburg, Pa.....	.....do.....	.....do.....	24.00	120.00
Oil City, Pa.....	.....do.....	.....do.....	24.00	48.00
Scranton, Pa.....	.....do.....	.....do.....	24.00	32.80
	.....do.....	.....do.....	24.00	32.00
Altoona, Pa.....	.....do.....	.....do.....	24.00	27.20
	.....do.....	.....do.....	24.00	16.00
Trenton, N. J.....	.....do.....	.....do.....	24.00	24.00
Wilmington, Del.....	.....do.....	.....do.....	24.00	40.00
New York, N. Y.....	1 room.....	Office powder inspector.....	17.67	212.04
	3 rooms.....	Officers' quarters.....	36.00	108.00
	4 rooms.....	.....do.....	48.00	95.60
	3 rooms.....	.....do.....	36.00	108.00
	4 rooms.....	.....do.....	48.00	95.60
	.....do.....	.....do.....	48.00	240.00
	3 rooms.....	.....do.....	36.00	180.00
	.....do.....	.....do.....	36.00	180.00
	.....do.....	.....do.....	36.00	18.00
	.....do.....	.....do.....	36.00	180.00
	.....do.....	.....do.....	36.00	180.00
	.....do.....	.....do.....	36.00	180.00
	.....do.....	.....do.....	36.00	100.80
	2 rooms.....	.....do.....	24.00	120.00
Newport, R. I.....	3 rooms.....	Office constructing quartermaster.....	40.00	480.00
Baltimore, Md.....	.....do.....	Officers' quarters.....	36.00	152.40
	.....do.....	.....do.....	36.00	30.00
	2 rooms.....	.....do.....	24.00	16.80
Charlotte, N. C.....	3 rooms.....	.....do.....	36.00	180.00
Goldsboro, N. C.....	.....do.....	.....do.....	36.00	62.40
Roanoke, Va.....	.....do.....	.....do.....	36.00	62.40
Richmond, Va.....	.....do.....	.....do.....	30.00	46.80
	2 rooms.....	.....do.....	24.00	32.00
Cayey, P. R.....	.....do.....	.....do.....	20.00	240.00
	.....do.....	.....do.....	18.00	216.00
	Land.....	Drill ground.....	34.60	415.20
	.....do.....	.....do.....	15.60	187.20
	.....do.....	.....do.....	12.00	144.00
	.....do.....	.....do.....	25.00	543.33
	.....do.....	.....do.....	30.00	360.00
	Building.....	Storehouse.....	15.00	45.00
	.....do.....	.....do.....	25.00	10.33

¹ Per room.

APPENDIX C.—Property rented by the Quartermaster's Department for use as offices, storehouses, barracks, quarters, etc.—Continued.

DEPARTMENT OF THE EAST—Continued.

Post or station.	Kind of property and number of rooms.	Purpose for which used.	Monthly rate of rent.	Total amount for year.
Cayey, P. R.	1 room	Commissary-sergeant's quarters	\$9.00	\$13.80
do	do	do	12.00	127.20
Albonito, P. R.	do	do	10.00	20.00
Humacao, P. R.	2 rooms	Officers' quarters	12.00	24.00
do	Building	Barracks	25.00	56.67
Caguas, P. R.	Land	Camp ground	12.50	77.80
Albonito, P. R.	do	Pasture	50.00	350.00
Mayaguez, P. R.	Building	Officers' quarters	60.00	66.00
do	do	do	48.00	52.80
do	do	do	48.00	49.20
do	do	do	36.00	12.00
do	do	do	36.00	45.60
do	do	do	24.00	30.40
do	do	do	24.00	24.00
do	do	do	24.00	117.00
do	do	do	36.00	106.80
do	do	do	36.00	158.40
do	do	do	24.00	288.00
do	do	do	24.00	288.00
do	do	do	36.00	360.00
do	do	do	24.00	180.00
do	do	Noncommissioned officers' quarters	12.00	13.20
do	do	do	12.00	16.40
do	do	do	12.00	12.00
do	do	Barracks Company A, Porto Rico regiment.	100.00	128.67
do	do	Hospital	72.00	144.00
do	do	Storehouse	24.00	48.00
do	Land	Stable ground	10.00	120.00
do	do	Drill ground	10.00	60.00
do	Building	Storehouse	35.00	24.50
do	do	Quartermaster's and commissary storehouse	60.00	346.66
do	do	Quartermaster's office and storehouse	70.00	530.50
do	do	Commissary office and storehouse	50.00	296.66
do	do	Quartermaster's shops	30.00	200.00
do	Building and ground.	Stable, granary, etc.	100.00	650.00
do	Open shed	Wagon shed	50.00	300.00
do	Stable	Cavalry stables	35.00	35.00
do	Building	Officers' quarters	24.00	117.60
do	do	do	24.00	117.60
do	do	do	36.00	310.80
do	do	do	24.00	48.00
San German, P. R.	do	Hospital	18.00	18.00
do	do	Noncommissioned officers' quarters	12.00	12.00
do	do	Officers' quarters	20.00	20.00
Aquadilla	1 room	Office	5.00	5.00
do	Building	Barracks	15.00	71.00
do	do	Storehouse	30.00	60.00
do	do	Officers' quarters	24.00	109.20
Ponce, P. R.	do	do	33.00	184.80
do	do	do	36.00	62.80
do	do	do	30.00	30.00
do	do	do	24.00	40.00
do	do	do	24.00	56.00
do	do	do	9.00	4.50
do	do	do	24.00	80.80
do	do	do	84.00	134.40
do	do	do	110.59	202.75
do	do	do	48.00	33.60
do	do	do	24.00	52.80
do	do	do	35.00	112.00
do	do	do	24.00	120.00
do	do	do	24.00	52.80
do	do	do	36.00	94.80
do	do	do	30.00	35.00
do	do	Noncommissioned officers' quarters	12.00	144.00
do	do	do	12.00	125.60
do	do	do	12.00	51.60
do	do	Barracks	60.00	70.00
do	Land	Corral	60.00	720.00
do	do	do	60.00	100.00
do	do	Pumping station	15.00	180.00
do	do	Cemetery	7.00	84.00
do	do	Reservoir	1.00	12.00

1 Per room.

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APPENDIX C.—Property rented by the Quartermaster's Department for use as offices, storehouses, barracks, quarters, etc.—Continued.

DEPARTMENT OF THE EAST—Continued.

Post or station.	Kind of property and number of rooms.	Purpose for which used.	Monthly rate of rent.	Total amount for year.
Adjuntas.....	Building.....	Officers' quarters.....	\$30.00	\$30.00
	do.....	do.....	18.00	18.00
	do.....	do.....	24.00	77.60
	do.....	do.....	24.00	48.00
	do.....	Quartermaster's storehouse.....	41.00	41.00
	do.....	Commissary storehouse.....	14.00	14.00
	do.....	Barracks.....	50.00	311.67
	do.....	do.....	20.00	17.33
	do.....	Guardhouse.....	6.00	5.20
	do.....	Hospital.....	15.00	92.10
	do.....	Noncommissioned officers' quarters.....	12.00	12.00
	Land.....	Corral.....	9.00	6.90
	do.....	do.....	9.00	57.50
	do.....	do.....	6.00	17.00
	do.....	Camp.....	6.00	5.60
	do.....	Corral U. S. Engineers.....	6.00	18.00
Uturado, P. R.....	Building.....	Quarters.....	10.00	10.00
San Juan.....	Land.....	Cemetery.....	6.00	60.00
	Room.....	Noncommissioned officers' quarters.....	12.00	12.00
	do.....	do.....	12.00	15.20
	do.....	do.....	12.00	48.00
	Building.....	Officers' quarters.....	24.00	30.40
	do.....	do.....	24.00	48.00
	do.....	Stable.....	25.00	50.00
	do.....	Officers' quarters.....	28.00	28.00
	Room.....	Noncommissioned officers' quarters.....	12.00	33.20
	do.....	do.....	12.00	53.20
Caguas, P. R.....	do.....	do.....	12.00	18.40
Rio Piedras.....	Land.....	Relay station.....	8.60	25.20
	do.....	Corral.....	100.00	100.00
Total.....				35,391.32

DEPARTMENT OF THE LAKES.

Chicago, Ill.....	33 rooms.....	Department headquarters.....	\$1,125.00	\$13,500.00
	Building.....	Subsistence storehouse.....	508.33	6,099.96
	do.....	Quartermaster's storehouse.....	200.00	1,178.33
	do.....	do.....	230.00	1,410.67
	do.....	Quartermaster's stables.....	150.00	1,800.00
Fort Sheridan.....	1 room.....	Quarters for hospital steward.....	12.00	144.00
	Camp ground.....	At Kenosha, Wis., for troops on target practice (7 camps).....		35.00
Fort Wayne.....	do.....	At Leesburg, Mich., for troops on target practice (4 camps).....		82.00
Total.....				24,194.96

DEPARTMENT OF THE MISSOURI.

Jefferson Barracks, Mo.....	Land.....	Camping grounds.....	\$10.00	\$10.00
Rush Springs, Ind. T.....	Corral and 2 rooms.....	Shelter for mules and teamsters.....	25.00	300.00
	do.....	do.....		
Ogden, Utah.....	2 rooms.....	Office for quartermaster's agent.....	25.00	300.00
Des Moines, Iowa.....	do.....	Officers' quarters.....	24.00	120.00
Dubuque, Iowa.....	4 rooms.....	do.....	48.00	91.20
Kansas City, Mo.....	3 rooms.....	do.....	36.00	180.00
Omaha, Nebr.....	4 rooms.....	do.....	48.00	117.60
Sheridan, Wyo.....	1 room.....	Office constructing quartermaster.....	17.33	129.98
	3 rooms.....	Officers' quarters.....	36.00	67.20
St. Louis, Mo.....	do.....	do.....	36.00	43.20
	do.....	do.....	48.00	182.40
	4 rooms.....	do.....	36.00	24.00
	3 rooms.....	do.....	36.00	8.40
Alton, Ill.....	do.....	do.....	24.00	52.00
Little Rock, Ark.....	2 rooms.....	do.....	36.00	100.80
	3 rooms.....	do.....		
Total.....				1,726.78

APPENDIX C.—*Property rented by the Quartermaster's Department for use as offices, store-houses, barracks, quarters, etc.—Continued.*

DEPARTMENT OF DAKOTA.

Post or station.	Kind of property and number of rooms.	Purpose for which used.	Monthly rate of rent.	Total amount for year.
Bismarck, N. Dak.	1 room	Office civil engineer	\$20.00	\$200.00
St. Paul, Minn.	4 rooms	Officers' quarters	48.00	288.00
	3 rooms	do.	86.00	108.00
Total				596.00

DEPARTMENT OF TEXAS.

Dallas, Tex.	2 rooms	Officers' quarters	\$24.00	\$96.00
Houston, Tex.	4 rooms	do.	48.00	76.80
Galveston, Tex.	1 room	Quarters for ordnance sergeant	12.00	67.20
Hebbronville, Tex.	do.	Quartermaster's office	8.00	96.00
Total				336.00

DEPARTMENT OF THE COLORADO.

Cooleys, Ariz.	1 room	Quarters for sergeant, signal corps	\$12.00	\$144.00
Denver, Colo.	do.	do.	12.00	144.00
	40 rooms	Headquarters	684.66	8,215.92
	15 rooms	Quarters for officers	12.00	180.00
	1 room	Storage, public property	40.00	480.00
	Building	Quartermaster's stables	50.00	600.00
Hellners, Ariz.	1 room	Quarters for sergeant, signal corps	12.00	158.40
Holbrook, Ariz.	do.	do.	12.00	9.20
	do.	Office, quartermaster's agent	5.00	60.00
Price, Utah	Building	Storage	15.00	180.00
	1 room	Quarters for sergeant, signal corps	12.00	156.00
Willcox, Ariz.	do.	do.	12.00	158.80
Total				10,486.32

DEPARTMENT OF CALIFORNIA.

San Francisco, Cal.	45 rooms	Offices, headquarters Department of California.	\$750.00	\$9,000.00
	3 rooms	Offices of additional paymasters	25.00	404.17
	1 room	do.	27.50	158.08
	do.	do.	40.00	120.00
	do.	Office of chief mustering officer	37.50	180.00
	do.	do.	40.00	40.00
	do.	Office of examining board, convened by Special Orders 37, A. G. O., 1901.	32.50	130.00
	21 rooms	Quarters for officers at department headquarters.	2.00	1,216.00
	15 rooms	Quarters for officers on duty at San Francisco, Cal.	12.00	304.40
	9 rooms	Quarters of enlisted men on duty in office of adjutant-general, Department of California.	12.00	671.60
	8 rooms	Quarters hospital corps	12.00	793.60
	2 rooms	Quarters signal corps	12.00	151.60
	1 room	Quarters of enlisted men on duty in office of inspector-general.	12.00	25.60
	1 room	Quarters of post quartermaster-sergeant.	12.00	31.20
United States Army general hospital, Presidio of San Francisco, Cal.				
Los Angeles, Cal.	2 rooms	Quarters for recruiting officer	12.00	48.00
San Diego Barracks, Cal.	Building and grounds.	Hospital	70.00	840.00
	16 rooms	Quarters for officers	12.00	724.00
	3 rooms	Quarters of quartermaster, commissary, and ordnance sergeants.	12.00	319.60

1 Per room.

QUARTERMASTER-GENERAL.

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APPENDIX C.—Property rented by the Quartermaster's Department for use as offices, storehouses, barracks, quarters, etc.—Continued.

DEPARTMENT OF CALIFORNIA—Continued.

Post or station.	Kind of property and number of rooms.	Purpose for which used.	Monthly rate of rent.	Total amount for year.
Honolulu, H. I	4 rooms	Offices of depot quartermaster	\$96.67	\$1,160.04
	Buildings and grounds	Hospital	175.00	2,100.00
	Building	Quartermaster's storehouse	125.00	1,500.00
	do	Subsistence storehouse	150.00	1,800.00
	Grounds	Quartermaster's corral	100.00	1,200.00
	do	Stock depot for transient animals en route to Manila, P. I.	40.00	480.00
	do	U. S. troops, Camp McKinley	50.00	600.00
	do	do	45.00	540.00
	do	do	45.00	540.00
	do	do	90.00	1,080.00
	do	Pasture for public animals		43.00
	Quarters	Quarters for commissioned officers		964.00
	do	Quarters for noncommissioned officers		346.00
Total				27,506.69

DEPARTMENT OF THE COLUMBIA.

Astoria, Oreg	2 rooms	Office constructing quartermaster	\$30.00	\$360.00
Seattle, Wash	1 room	Quartermaster's office	65.00	390.00
	8 rooms	do	90.00	512.50
	3 rooms	do		55.00
	1 room	Office, signal officer	50.00	36.67
	do	Office, subsistence department	35.00	105.00
	do	do	25.00	225.00
	Building	Storehouse	150.00	1,800.00
	Storage space	Storage, subsistence department		336.96
	Building	Stable and shed	15.00	180.00
	Land and sheds	Corral and pasture	30.00	240.00
	Land	do	65.00	225.00
	Building	Stable	40.00	133.33
	Wharf, etc	Dock and storage, army transport service	400.00	800.00
	Lodgings	For enlisted men and employees en route to Alaska		9.50
Tacoma, Wash	1 room	Quartermaster's office	39.50	116.50
Port Townsend, Wash	do	Office, superintendent of construction	12.00	8.00
Portland, Oreg	Building	Officers' quarters	36.00	252.00
	7 rooms	Offices	111.00	1,332.00
Total				7,117.46

DEPARTMENT OF ALASKA.

Fort St. Michael, Alaska	Buildings, etc.	Barracks, quarters, storage, etc.	\$666.67	\$8,000.04
Skagway, Alaska	Building	Barracks	175.00	2,100.00
	do	do	50.00	600.00
	do	do	100.00	800.00
	do	Officers' quarters	50.00	600.00
	do	do	20.00	240.00
	2 rooms	do	30.00	270.00
	do	do	16.00	17.60
	Building	Quarters for hospital steward	8.00	28.50
	do	Quartermaster's and subsistence storehouse	80.00	480.00
	do	do	15.00	180.00
	Part of building	do	10.00	120.00
	Building	Hospital	35.00	420.00
	2 rooms	do	6.00	7.80
	Building	Quartermaster's stable	6.00	12.00
	do	Stable and wagon shed	20.00	200.00
Total				14,075.94

¹ Per room.

APPENDIX .—Property rented by the Quartermaster's Department for use as offices, store houses, barracks, quarters, etc.—Continued.

GENERAL DEPOTS OF THE QUARTERMASTER'S DEPARTMENT.

Post or station.	Kind of property and number of rooms.	Purpose for which used.	Monthly rate of rent.	Total amount for year.
Philadelphia depot....	House and stable, 20 rooms.	Quartermaster's office and stable	\$291.67	\$3,500.04
	3 rooms.....	Storage	500.00	6,000.00
	2 rooms.....	.....do.....	416.67	2,500.02
	.....do.....	.....do.....	416.66	416.66
	1 room.....	.....do.....	200.00	1,000.00
New York depot.....	Building.....	Warehouse and offices	416.66	5,000.00
	.....do.....	Clothing storehouse	1,500.00	18,000.00
	3 lofts.....	Storerooms.....	35.00	420.00
	Building.....	Medical department, offices, and storehouse.....	1,000.00	12,000.00
	.....do.....	Storage	416.66	5,000.00
	.....do.....	Stable and carriage house	112.50	1,350.00
	1 room.....	Quarters for hospital steward on duty with attending surgeon.....	14.00	168.00
	.....do.....	Quarters for private hospital corps	12.00	144.00
	.....do.....	Storeroom, army transport service.....	110.00	1,200.00
	2 rooms.....	.....do.....	300.00	3,600.00
St. Louis depot.....	Building.....	Stable	30.00	360.00
	.....do.....	Storehouse for subsistence department	75.00	900.00
	.....do.....	Storehouse for medical department.....	41.67	83.34
	.....do.....	.....do.....	84.17	252.51
	.....do.....	.....do.....	166.67	2,000.00
San Francisco depot...	.....do.....	Storehouse and offices for quartermaster's department.....	666.67	8,000.00
	.....do.....	Offices and storehouse for subsistence department.....	750.00	9,000.00
	.....do.....	Quartermaster's storehouse.....	400.00	4,800.00
	Part of building.....	.....do.....	75.00	670.00
	Building.....	.....do.....	300.00	3,600.00
	.....do.....	Offices and storehouse for medical department.....	1,000.00	12,000.00
	.....do.....	Offices and storehouse for quartermaster's department.....	500.00	3,300.00
	Stable room.....	Stable for subsistence department.....	7.50	90.00
	Storage.....	Storage oils, etc		73.69
	8 rooms.....	Quarters for noncommissioned officers on duty in commissary department.....	112.00	49.20
Jeffersonville depot	4 rooms.....	Officers' quarters.....	48.00	120.00
	.....do.....	.....do.....	48.00	120.00
	1 room.....	Quarters for post quartermaster-sergeant.....	12.00	78.00
Washington depot.....	Lots 49 to 58 and 63 and parts of lots 59 and 62, square 100.	Occupied by depot stables and storehouses.....	175.00	2,100.00
	Lots 506, 508, 510, square No. 268.	Quartermaster's storehouse	150.00	1,800.00
	1 room.....	Quarters for hospital steward on duty at office of attending surgeon.....	21.00	252.00
	.....do.....	Quarters for hospital steward.....	12.00	144.00
	.....do.....	.....do.....	12.00	58.40
	.....do.....	Quarters for private hospital corps	12.00	144.00
	.....do.....	Quarters for private signal corps	12.00	52.00
	.....do.....	Quarters for private on duty at army headquarters.....	12.00	144.00
	.....do.....	.....do.....	12.00	144.00
	.....do.....	Quarters for sergeant	12.00	108.00
	.....do.....	Quarters for private hospital corps	12.00	75.20
	.....do.....	Quarters for private signal corps	12.00	5.20
	.....do.....	Quarters for corporal, Fifth Cavalry.....	12.00	36.00
	.....do.....	Quarters for private hospital corps	12.00	39.20
	.....do.....	Quarters for hospital steward.....	12.00	54.40
	.....do.....	Quarters for private hospital corps	12.00	54.40
	.....do.....	.....do.....	12.00	18.40
	.....do.....	.....do.....	12.00	8.00
	.....do.....	.....do.....	50.00	35.00
	Building, 1725 G street.	Office for examining and supervising board dental surgeons.....		
Lodgings		Enlisted men U. S. Army, accompanying Corps of Cadets, U. S. Military Academy, attending inaugural ceremonies Mar. 4, 1901.		15.00

¹ Per room.

APPENDIX C.—*Property rented by the Quartermaster's Department for use as offices, storehouses, barracks, quarters, etc.*—Continued.

GENERAL DEPOTS OF THE QUARTERMASTER'S DEPARTMENT—Continued.

Post or station.	Kind of property and number of rooms.	Purpose for which used.	Monthly rate of rent.	Total amount for year.
Washington depot.....	Lodgings.....	For cadets and officers, Corps of Cadets, U. S. Military Academy, attending inaugural ceremonies Mar. 4, 1901.		\$705.00
	.....do.....	For men of Corps of Cadets, U. S. Military Academy, attending inaugural ceremonies Mar. 4, 1901.		278.00
Total				112,060.66

RECAPITULATION.

Department of the East.....	\$35,391.32
Department of the Lakes.....	25,194.96
Department of the Missouri.....	1,726.78
Department of Dakota.....	596.00
Department of Texas.....	886.00
Department of the Colorado.....	10,486.32
Department of California.....	27,506.69
Department of the Columbia.....	7,117.46
Department of Alaska.....	14,075.94
General depots of the Quartermaster's Department.....	112,060.66
Division of the Philippines (not shown in detail).....	85,178.05
Japan (remitted for rents).....	2,900.00
Total.....	321,568.18

WAR DEPARTMENT,
QUARTERMASTER-GENERAL'S OFFICE,
Washington, D. C., August 31, 1901.

GENERAL: I have the honor to submit annual report of the reservation branch of this office for fiscal year ending June 30, 1901.

This branch, under Special Orders, No. 187, of 1898, Adjutant-General's Office, is charged with providing water supply, sewerage, light, and heating of military posts, camps, and stations, hiring of grounds for military purposes, collection and filing of title papers, and information pertaining to all lands under charge of the War Department, purchased or appropriated for army or other military use, except when designated for permanent military fortifications, or for arsenals, etc.

It is also charged with all correspondence in connection with fire protection, post and reservation maps, surveys, topography, and other miscellaneous subjects.

OLD FORT BRADY, MICH.

Under act approved July 8, 1886, General Orders 52, 1886, the grounds comprising Old Fort Brady, authorized to be sold, were duly platted, appraised, etc.

By public and private sale all lots, with exception of that known as the "cemetery lot" and a certain square held as site for a public building, have finally been disposed of at full appraised valuation, \$70,522.54, which amount, less expenses attending the sales, has been deposited to credit of the United States Treasurer.

The "cemetery lot" was, on August 25, 1897, leased by the Secretary of War for five years from September 7, 1897, at a nominal consideration, to the Soo Light Guards, Company G, Fifth Regiment Michigan National Guard, for the erection of an armory for drill purposes.

Regarding the square held as site for a public building, records show that the Secretary of War, September 11, 1893, in approving the report of board for sale of the various lots, held that—

The square of ground lying between Water street on the north, Portage avenue on the south, Brady street on the east, and Bingham avenue on the west, as shown on * * * map, is withheld from sale for the present—

it being at the time contemplated to utilize it in the future for a public building (custom-house, etc.).

Records further show that city council of Sault Ste. Marie subsequently petitioned Congress for an appropriation with which to erect thereon a building for post-office, custom-house, and other purposes.

OLD FORT OMAHA.

Act approved July 23, 1888, General Orders, No. 60 of 1888, authorizes the Secretary of War, after purchase and construction of new post (now known as Fort Crook, Nebr.), to sell the reservation known as Fort Omaha.

The new post has been built, but, owing to business depression of former years, legislation looking to its transfer to the State, recent wars, etc., no definite steps have been taken with view to disposing of this valuable parcel of land, covering about 80 acres.

On January 2, 1900, the Major-General Commanding the Army recommended that this reservation be retained, as in his judgment, under changed conditions of affairs, etc., it would be most valuable for military purposes, and, further, that any steps looking to sale of this land be suspended.

On August 20, 1900, he recommended that the buildings and grounds of this reservation be kept in perfect order and repair, as the military conditions of the country had so materially changed as to make it necessary that this reservation be retained, which was approved by the Secretary of War September 17, 1900.

SEACOAST LANDS.

By Special Orders, No. 37, 1899, paragraph 59, the Secretary of War appointed a board of officers to meet in Washington February 15, 1899, to investigate and report upon the additional land necessary at the following-named places to provide for the garrison which it was the intention to station at each place; also to ascertain the cost of such additional land and whether the same could be obtained by purchase:

*	*	*	*	*	*	*
Fort Mott, N. J. (Finns Point).						
*	*	*	*	*	*	*
Fort Armistead, Md. (Hawkins Point).						
*	*	*	*	*	*	*

At Fort Mott the Secretary of War has authorized the acquisition of some 40½ acres, and condemnation proceedings are now in progress.

At Fort Armistead (Hawkins Point, Md.) the Secretary of War has authorized acquisition of some 31 acres.

Efforts are still being made to secure the same.

SULLIVANS ISLAND, SOUTH CAROLINA.

In connection with the land acquired under fortification act approved May 25, 1900, General Orders, No. 77, 1900, at Sullivan's Island, South Carolina, the following (General Orders, No. 75, 1901) has been issued, announcing its limits "as an addition to the military reservation of Fort Moultrie, S. C.:"

WAR DEPARTMENT, *Washington, May 21, 1901.*

The following-described lands acquired under an act of the legislature of the State of South Carolina approved February 9, 1900, entitled "An act granting to the United States the title of this State to and the jurisdiction of this State over certain lands on Sullivan's Island, in Charleston County, for military purposes," are hereby announced as an addition to the military reservation of Fort Moultrie, S. C.:

Beginning at a point on the prolongation or extension in a northerly direction of the westerly line of lot 131, as laid down on the plan of the town of Moultrieville, on Sullivan's Island, in Charleston County, S. C., on the back beach and 100 yards beyond high-water line; thence in an easterly direction, following the meanderings or indentations of a line 100 yards beyond said high-water line to the intersection of the prolongation or extension in a northerly direction of the western line of Pettigru street; thence in a southerly direction along said prolongation or extension of said westerly line of Pettigru street, along said westerly line of Pettigru street, and along the prolongation or extension in a southerly direction of said westerly line of Pettigru street to a point 100 yards below low-water line in the sea; thence in a westerly direction, following the meanderings or indentations of a line in the sea 100 yards beyond low-water line to its intersection with the prolongation or extension in a southerly direction of the eastern side of Sumter street; thence in a northerly direction along said prolongation or extension of the eastern side of Sumter street and along said eastern side of Sumter street to the place of beginning.

ELIHU ROOT,
Secretary of War.

By command of Lieutenant-General Miles:

H. C. CORBIN,
Adjutant-General, Major-General, U. S. A.

FORT CONSTITUTION, N. H.

In sundry civil act of June 6, 1900, General Orders, No. 84, 1900, \$30,000 is appropriated for the acquisition of the land in the square surrounding Fort Constitution, at Newcastle, N. H., to be used for barracks and quarters for troops. It has been impossible to secure the land for the amount appropriated, and no purchase has been made.

NEW POST AT DES MOINES, IOWA.

The following act of Congress is published for the information and government of all concerned. (General Orders, No. 48, 1900.)

AN ACT to establish a military post at or near Des Moines, Iowa.

Be it enacted by the Senate and House of Representatives of the United States of America in Congress assembled, That upon the transfer and conveyance to the United States of a good and sufficient title to not less than four hundred acres of land, without cost to the United States, situated at or near the city of Des Moines, in the county of Polk and State of Iowa, and on or near a railroad, and constituting an eligible and suitable site for an army post, and to be approved and accepted by the Secretary of War for that purpose, then and thereupon there shall be, and is hereby, established and

located on said land a United States army post, of such character and capacity as the Secretary of War shall direct and approve.

Approved, April 4, 1900.

By command of Major-General Miles:

H. C. CORBIN,
Adjutant-General.

Under the above, 400 acres have been donated to the United States and accepted by the Secretary of War, favorable opinion regarding title having been rendered by the Attorney-General.

GENERAL ORDERS, }
No. 103.

HEADQUARTERS OF THE ARMY,
ADJUTANT-GENERAL'S OFFICE,
Washington, August 5, 1901.

I. The following, having been received from the War Department, is published for the information of all concerned:

WAR DEPARTMENT, Washington, D. C., August 5, 1901.

The United States having acquired the northeast quarter of section 33, and the northwest quarter and the north half of the southwest quarter of section 34, township 78 north, range 24 west of the fifth principal meridian, as the site for a military post near Des Moines, Iowa, the same is hereby announced as a military reservation.

WM. CARY SANGER,
Acting Secretary of War.

GREAT DIAMOND ISLAND, MAINE.

Under sundry civil act of June 6, 1900, General Orders 84, 1900, and authority of the Secretary of War, 111 acres of land have been secured at Great Diamond Island, Maine, through condemnation proceedings, at cost of \$149,850, favorable opinion regarding title having been given by Attorney-General.

FORT TERRY (PLUM ISLAND), N. Y.

Under sundry civil act, June 6, 1900, General Orders 84, 1900, and authority of the Secretary of War, 647 acres of land at Fort Terry (Plum Island), N. Y., have been secured at cost of \$64,700, the Attorney-General having rendered favorable opinion regarding United States title.

The following having been received from the War Department, is published for the information of all concerned:

WAR DEPARTMENT, Washington, D. C., July 19, 1901.

The United States having acquired by deed from Abram S. Hewitt and wife, dated the 24th day of June, 1901, and recorded in Suffolk County clerk's office in liber 508 of deeds, at page 52, all that portion of Plum Island, in the State of New York, not already owned by the United States, the same is hereby announced as an addition to the military reservation of Fort Terry, N. Y., and the said reservation now comprises the entire island except the light-house reservation of about 3 acres at the western end thereof.

WM. CARY SANGER,
Acting Secretary of War.

By command of Lieutenant-General Miles:

THOMAS WARD, *Acting Adjutant-General.*

FORT CASEY, WASH.

August 24, 1900: Secretary of War approved report of board of officers for the acquiring of some 200 acres of land at Fort Casey by condemnation, and district court, has since close of fiscal year, rendered verdict in favor of owners for \$16,000.

FORT WORDEN, WASH.

August 24, 1900: Secretary of War approved report of board of officers for the acquiring by condemnation of some 159 acres at approximate cost of \$35,000, which proceedings are still in progress.

FORT SCREVEN, GA.

Under sundry civil act of March 3, 1901, Secretary of War March 19, 1901, authorized purchase of certain land at Fort Screven, Ga., at approximated cost of \$12,065, and efforts are being made to secure same by purchase and condemnation proceedings.

General orders affecting military reservations issued during the year have been as follows:

General Orders 91, 1900, announces limits of lands recently acquired at Fort Crockett, Tex.

General Orders 100, 1900, announces President's action in setting aside certain land at Port Valdez, Alaska, for military purposes.

General Orders 109, 1900, announces President's action in transferring certain lands at Fort Egbert, Alaska, to the Interior Department.

General Orders 114, 1900, announces President's action designating new post at mouth of Nome River, Alaska, as Fort Davis.

General Orders 119, 1900, announces President's action designating new post at Port Valdez, Alaska, as Fort Liscum.

General Orders 132, 1900, announces President's action transferring Fort Sherman, Idaho, reservation; also portion of Fort St. Michael, Alaska, reservation to Interior Department.

General Orders 141, 1900, announces President's action in setting aside for military purposes certain land at Cape Nome, Alaska, as a military reservation for Fort Davis.

General Orders 46, 1901, announces action of President in modifying limits of the wood reservation of Fort Sill, Okla.

General Orders 75, 1901, announces limits of land recently acquired on Sullivan's Island as an addition to Fort Moultrie Reservation.

CUSTODIANS.

Custodians have been employed during the year and paid by the Quartermaster's Department in care of following reservations:

Madison Barracks, N. Y., target range, James Flemming, \$15 per month.

Old Fort Bliss, Tex., James E. Tustin, \$60 per month.

Old Fort Omaha, Nebr., O. E. Stearn, \$45 per month.

Whipple Barracks, Ariz., A. G. Oliver, \$60 per month.

Fort Custer, Mont., H. C. Bullard served until September 26, 1900, at \$45 per month, since which time James Swisher has been employed at same pay.

Fort Lincoln, N. Dak., A. J. Weide and A. K. Sleeper, \$40 per month each.

At Fort Townsend, Wash., J. W. Brown.

At Fort Davis, Tex., J. L. James.

At Monterey, Cal., Francis Dowd, served without money consideration.

List of military reservations turned over by the War Department to the Interior Department, or otherwise disposed of by the War Department, from 1858 to June 30, 1901, with date of relinquishment, authority therefor, etc.

Name of post.	Date of relinquishment.	Authority for relinquishment.	Remarks.
Abercrombie, Fort, Dak.....	Mar. 25, 1871	Act Feb. 24, 1871.....	Portion east of the Red River of the North. G. O. 19, A. G. O., 1871.
Do.....	July 14, 1880	Act June 10, 1880.....	Reservation abolished. G. O. 55, A. G. O., 1880.
Do.....		Act July 15, 1882.....	Reservation abolished. G. O. 85, A. G. O., 1882.
Abraham Lincoln, Fort, N. Dak.	Oct. 15, 1891	Act July 5, 1884.....	15,040 acres, also Sibleys Island, containing 13,696 acres. G. O. 84, A. G. O., 1891.
Arbuckle, Fort, Ind. T.....	July 9, 1870	Indian treaty of Apr. 28, 1866.	
Assiniboine, Fort, Mont....	Oct. 22, 1891	Act July 5, 1884.....	Hay reservation, coal reservation, and part of post reservation. Area not stated. G. O. 85, A. G. O., 1891.
Atkinson, Fort, Iowa.....		Act June 7, 1860.....	12 Stat., 28.
Austin, Tex.....		Act Mar. 5, 1888.....	Arsenal block. For educational purposes only. G. O. 30, A. G. O., 1888.
Baton Rouge Barracks, La. .	Aug. 22, 1884	Act July 5, 1884.....	44.17 acres. G. O. 102, A. G. O., 1884.
Do.....		Act June 12, 1886.....	By Secretary Interior to State University. G. O. 55, A. G. O., 1886.
Bennett, Fort, S. Dak.....		Order of Secretary of War of Oct. 3, 1891, G. O. 79, A. G. O., 1891.	On Indian reservation. No formal reservation.
Benton, Fort, Mont.....	Jan. 5, 1883	Act Aug. 4, 1882.....	G. O. 110, A. G. O., 1882.
Bidwell, Fort, Cal.....	Feb. 13, 1885	Act July 5, 1884.....	Portion 123.26 acres. G. O. 16, A. G. O., 1885.
Do.....	Nov. 19, 1890	.....do.....	Remainder, 3,090 acres. G. O. 135, A. G. O., 1890.
Bois Blanc Island.....	July 22, 1884	.....do.....	9,199.43 acres. G. O. 80, A. G. O., 1884.
Boise, Fort, Idaho.....	Sept. 19, 1874		Wood and sawmill reservation. Not formally reserved.
Do.....	Apr. 19, 1884	Act Feb. 14, 1863. Sec. 9, 10 Stat., 1859.	Hay reservation in excess of 640 acres.
Bowie, Fort, Ariz.....	Nov. 14, 1894	Act July 5, 1884.....	23,040 acres. G. O. 68, 1894.
Bragg, Fort, Cal.....		Act July 27, 1868.....	On Mendocino Indian Reservation. G. O. 74, A. G. O., 1878.
Brady, Fort, Mich.....	Jan. 21, 1878	Act Mar. 1, 1869.....	Not to exceed 1 acre to Baptist Missionary Society. G. O. 25, A. G. O., 1869.
Do.....		Act Mar. 3, 1875.....	Grants 1.28 acres for school purposes. G. O. 41, A. G. O., 1875.
Do.....	Dec. 3, 1894	Act July 5, 1884.....	The lands embraced in fractional sec. 2, T. 47 N., R. 1 W., Michigan meridian, which was reserved from sale for the use of Fort Brady, Mich., by Executive order of Sept. 2, 1847, 3½ acres. G. O. 19, 1895.
Bridger, Fort, Wyo.....	Mar. 25, 1871	Act Feb. 24, 1871.....	Portion 496 square miles. G. O. 19, A. G. O., 1871.
Do.....	Feb. 15, 1872	.....do.....	Modifies G. O. 19, A. G. O., 1871.
Do.....	July 22, 1884	Act July 5, 1884.....	Coal reservation, 99.17 acres, G. O. 80, A. G. O., 1884.
Do.....	Oct. 14, 1890	.....do.....	10,240 acres. G. O. 123, A. G. O., 1890.
Brooke, Fort, Fla.....	Jan. 4, 1883	Act Aug. 18, 1856.....	148.11 acres. 11 Stat., p. 87.
Buford, Fort, N. Dak.....	July 30, 1891	Act July 5, 1884.....	Portion. Area not stated. G. O. 68, A. G. O., 1891.
Do.....	Oct. 31, 1895	.....do.....	Remaining portion 444,090 acres, G. O. 58, A. G. O., 1895.
Butler, Fort, N. Mex.....	July 22, 1884	.....do.....	76,800 acres. G. O. 80, A. G. O., 1884.
Cady, Camp, Cal.....	.....do.....	.....do.....	1,562 acres. G. O. 80, A. G. O., 1884.
Cameron, Fort, Utah.....	July 2, 1885	.....do.....	23,378 acres. War Dept. circular, July 9, 1885.
Cantonment, Ind. T.....	Sept. 7, 1882	Act July 31, 1882.....	For Indian schools.
Carlin (near), Nev.....	Mar. 20, 1888	Act July 5, 1884.....	920 acres. War Dept. circular, Mar. 26, 1888.
Carlisle Barracks, Pa.....	Dec. 22, 1879	Order of Secretary of War, Aug. 22, 1879.	About 30 acres. For Indian school purposes until required for military purposes.
Cascades, Fort, Wash.....	Feb. 2, 1867		Private claim.
Cat Island, Miss.....	Nov. 1, 1895	Act July 5, 1884.....	Portion. G. O. 58, A. G. O., 1895.

List of military reservations turned over by the War Department to the Interior Department, or otherwise disposed of by the War Department, etc.—Continued.

Name of post.	Date of relinquishment.	Authority for relinquishment.	Remarks.
Churchill, Fort, Nev.....	June 15, 1871		No formal reservation.
Clinch, Fort, Fla.....	Mar. 23, 1897	Act July 5, 1884.....	Portion. G. O. 21, A. G. O., 1897.
Collins, Fort, Dak.....	July 16, 1872	Act May 15, 1872.....	G. O. 35, A. G. O., 1872.
Colville, Fort, Wash.....	Feb. 26, 1887	Act July 5, 1884.....	1,070 acres. War Dept. circular, Mar. 1, 1887.
Covington, Fort, Md.....	Jan. —, 1869	Act June 25, 1868.....	G. O. 39, A. G. O., 1868.
Coeur d'Alene, Fort, Idaho.....	Apr. 27, 1896	Act July 5, 1884.....	Winter pasturage. 640 acres. War Dept. circular, May 3, 1886.
Council Grove, Okla.....	Jan. 19, 1895	.....do.....	Military timber reserve for Fort Reno, Okla., 5,760 acres. G. O. 19, 1895.
Craig, Fort, N. Mex.....	Mar. 3, 1885	.....do.....	24,895 acres. G. O. 21, A. G. O., 1885.
Crawford, Fort, Iowa.....		Act July 1, 1864.....	
Crawford, Fort, Colo.....	July 22, 1884	Act July 5, 1884.....	Portion. G. O. 80, A. G. O., 1884.
Do.....	Dec. 30, 1890	.....do.....	Remainder, 5,472 acres. G. O. 148, A. G. O., 1890.
Crawford, Fort, Wis.....		Act Mar. 3, 1862.....	
Crittenden, Fort, Utah.....	July 22, 1884	Act July 5, 1884.....	94,550 acres. G. O. 80, A. G. O., 1884.
Crittenden, Camp, Ariz.....	.....do.....	.....do.....	3,278.08 acres. G. O. 80, A. G. O., 1884.
Crook, Fort, Cal.....		Act Feb. 15, 1881.....	Act restores to public domain. G. O. 25, A. G. O., 1881.
Cummings, Fort, N. Mex.....	Oct. 20, 1891	Act July 5, 1884.....	23,040 acres. G. O. 85, A. G. O., 1891.
D. A. Russell, Fort, Wyo.....		Act Mar. 2, 1895.....	160 acres, State of Wyo. G. O. 13, 1895.
Dakota, Fort, Dak.....		Act July 14, 1870.....	
Dalles, Fort, Oreg.....	Mar. 28, 1877	Act Mar. 3, 1877.....	G. O. 24, 1877.
Date Creek, Camp, Oreg.....	Dec. 7, 1874	Act June 22, 1874.....	G. O. 88, A. G. O., 1874.
Del Rio, Tex.....		Act May 19, 1896.....	Reconveyed to original grantors, the San Felipe Agricultural, Manufacturing and Irrigation Co., 409 acres.
Dodge, Fort, Kans.....	Jan. 12, 1885	Act July 5, 1884.....	12,000 acres. G. O. 6, A. G. O., 1885.
Douglas, Fort, Utah.....		Act May 16, 1874.....	Not to exceed 20 acres for a public cemetery. G. O. 47, A. G. O., 1874.
Do.....	Apr. 17, 1885	Act Jan. 21, 1885 (23 Stat., 284).	Portion (151.81 acres) private claim. G. O. 35, A. G. O., 1885.
Drum Barracks, Cal.....		Act Feb. 25, 1873.....	To be reconveyed to Banning and Wilson.
Egbert, Fort, Alaska.....	Aug. 13, 1900	Act July 5, 1884.....	Portion. G. O. 109, 1900.
Ellis, Fort, Mont.....	July 26, 1886	.....do.....	32,116.10 acres. War Dept. circular, July 29, 1886.
Elliott, Fort, Tex.....	Oct. 14, 1890	.....do.....	2,560 acres. G. O. 123, A. G. O., 1890.
El Paso, Tex.....	Apr. 6, 1894	Act Mar. 3, 1895.....	Old cemetery site, 153,400 square feet. Transferred to city of El Paso for park or other public purposes. G. O. 11, A. G. O., 1894.
Fayette, Fort, Pa.....		Act May 21, 1890.....	Public, No. 125. See Pittsburg.
Fetterman, Fort, Wyo.....	July 22, 1884	Act July 5, 1884.....	45,085.56 acres. G. O. 80, A. G. O., 1884.
Fred Steele, Fort, Wyo.....	Aug. 9, 1886	.....do.....	24,833.29 acres. Except cemetery site. War Department circular, Aug. 12, 1886.
Galveston, Tex.....		Act July 15, 1870.....	Lands donated to city. G. O. 100, A. G. O., 1870.
Gaston, Fort, Cal.....	Feb. 11, 1892	Act July 31, 1882 (22 Stat., 181).	451.5 acres. No general order. Letter of Secretary of War of Feb. 11, 1892. See G. O. 14, A. G. O., 1892.
Gibson, Fort, Ind. T.....	Feb. 7, 1891	Act July 5, 1884.....	5,541 acres. National cemetery excepted. G. O. 15, A. G. O., 1891.
Goodwin, Camp, Ariz.....	July 22, 1884	.....do.....	5,760 acres. G. O. 80, A. G. O., 1884.
Grant, Camp (old), Ariz.....	.....do.....	.....do.....	2,031.70 acres. G. O. 80, A. G. O., 1884.
Green, Fort, R. I.....		Act Feb. 23, 1887.....	To city of Newport as a public park. G. O. 25, A. G. O., 1887.
Gratiot, Fort, Mich.....	Nov. 9, 1880	Act July 20, 1868.....	Portion. G. O. 60, A. G. O., 1868.
Do.....		Act Mar. 18, 1870.	20.9 acres. G. O. 49, A. G. O., 1870.
Do.....		Amends act July 20, 1868.	
Do.....		Act Mar 3, 1873.....	Cemetery grounds. G. O. 45, A. G. O., 1873.

List of military reservations turned over by the War Department to the Interior Department, or otherwise disposed of by the War Department, etc.—Continued.

Name of post.	Date of relinquishment.	Authority for relinquishment.	Remarks.
Gratiot, Fort, Mich		Act June 16, 1880.	Remainder. G. O. 55, A. G. O., 1880.
Greenwood Island, Miss	Dec. 26, 1890	Act July 5, 1884	100 acres. G. O. 147, A. G. O., 1890.
Hall, Fort, Idaho	April 26, 1883	Act July 31, 1882	For Indian schools.
Halleck, Fort, Nev	Oct. 11, 1886	Act July 5, 1884	10,900.93 acres. War Department circular, Oct. 28, 1886.
Hamer, Fort, Fla	Feb. 26, 1876	Act Aug. 18, 1856	
Hancock Barracks, Me		Act Mar. 14, 1872	Sale authorized.
Hancock, Fort, Tex	Nov. 1, 1895	Act July 5, 1884	469 acres. G. O. 58, A. G. O., 1895.
Harker, Fort, Kans	July 12, 1890	Act June 16, 1890	G. O. 55, A. G. O., 1890.
Hartsuff, Fort, Nebr	July 22, 1884	Act July 5, 1884	3,251.41 acres. G. O. 80, A. G. O., 1884.
Hays, Fort, Kans	May 13, 1886	Act June 11, 1884	Portion not to exceed 165 acres. G. O. 53, A. G. O., 1884.
Do	Nov. 2, 1889	Act July 5, 1884	Remainder, 7,600 acres. G. O. 81, A. G. O., 1889.
Horn Island, Miss	Nov. 1, 1895	do	Portion. G. O. 58, A. G. O., 1895.
Hoskins, Fort, Oreg	Feb. 16, 1891		No formal reservation.
Hot Springs, Ark	Aug. 27, 1890	Act July 5, 1884	All of square or block 94. G. O. 96, A. G. O., 1890.
Houston, Fort, Tex		Act June 23, 1874	Donated to Fisk University for educational purposes. G. O. 86, A. G. O., 1874.
Howard, Fort, Wis		Act Mar. 3, 1863	Portion.
Do		Act July 4, 1866	Remainder.
Hualpai, Fort, Ariz	Apr. 22, 1874		No formal reservation.
Humboldt, Fort, Cal	Apr. 6, 1870		Do.
Independence, Camp, Cal	July 22, 1884	Act July 5, 1884	5,210.38 acres. G. O. 80, A. G. O., 1884.
Jesup, Fort, La	Mar. 25, 1871	Act Feb. 24, 1871	G. O. 19, A. G. O., 1871.
Jones, Fort, Cal	May 27, 1870		No formal reservation.
Jupiter, Fort, Fla	Mar. 16, 1880	Act Aug. 18, 1856 (11 Stat., 87).	9,088.38 acres. Except light-house lot.
Kearney, Fort (old), Iowa		Act Apr. 15, 1874	
Kearney, Fort, Nebr	Dec. 2, 1876	Act July 21, 1876	G. O. 111, A. G. O., 1876.
Keogh, Fort, Mont		Act July 30, 1890 (Public, 218).	Portion east of Tongue River.
Key, Biscayne, Fla	July 9, 1870	Act Aug. 18, 1856	
Klamath, Fort, Oreg	May 4, 1886	Act July 5, 1884	3,335.68 acres. War Department circular, May 6, 1886.
Lane, Fort, Oreg	Mar. 25, 1871	Act Feb. 24, 1871	G. O. 19, A. G. O., 1871.
Lapwai, Fort, Idaho	June 5, 1882	Act July 31, 1882	Put reserve for Indian schools.
Do	May 7, 1884	Act Feb. 14, 1853 (10 Stat., 159).	Hay reservation in excess of 640 acres.
Laramie, Fort, Wyo		Act Aug. 14, 1876	Restores a portion to public domain. G. O. 90, A. G. O., 1876.
Do	June 9, 1890	Act July 5, 1884	G. O. 60, A. G. O., 1890.
Do	Nov. 4, 1897	do	Wood and timber reserve, 39,680 acres. G. O. 61, A. G. O., 1897.
Larned, Fort, Kans	Mar. 26, 1883	Act Aug. 4, 1882	G. O. 110, A. G. O., 1882.
Leavenworth, Fort, Kans	Dec. 23, 1868	Act July 2, 1868	Sale of 20 acres in southeast corner to Leavenworth Coal Co.
Do		Act Feb. 9, 1871	Sale of 128.82 acres to Kansas Agricultural and Mechanical Association. G. O. 14, A. G. O., 1871.
Do		Act Mar. 2, 1889	Lease of 9.75 acres to Leavenworth Water Co. while lands are used as a military site. G. O. 39, A. G. O., 1889.
Leavenworth Prison, Kans	Mar. 2, 1895	Act Mar. 2, 1895	Buildings and grounds transferred to Department of Justice. For reservation limits see G. O. 19, 1895.
Lewis, Fort, Colo	Nov. 12, 1891	Act July 31, 1882 (22 Stat., 181).	30,336 acres. G. O. 89, A. G. O., 1891.
Do	Feb. 16, 1895	Act July 5, 1894	G. O. 19, 1895.
Little Rock Barracks, Ark	Oct. 14, 1890	Act July 5, 1884	36.01 acres. G. O. 123, A. G. O., 1890. Act Apr. 23, 1892, transfers to city of Little Rock.
Logan, Fort, Mont	June 4, 1881	Act May 8, 1880	Sale at auction. G. O. 38, A. G. O., 1880.
Louisiana, State of a	Sept. 23, 1886	Act July 5, 1880	6,170.79 acres. War Department circular, Sept. 23, 1886.
Lowell, Fort, Ariz	Mar. 5, 1891	Act July 5, 1884	Area not stated. G. O. 24, A. G. O., 1891.
Lyon, Fort (old), Colo	July 22, 1884	do	38,000 acres. G. O. 80, A. G. O., 1884.

a Ten reservations on the Gulf coast, as follows: One near the eastern mouth of Bayou Lafourche; one near western mouth of Bayou Lafourche; one on Bayou Plat; one near western entrance to Caminada Bay; one near the pass at the eastern end of Grand Terre Island; one near the mouth of Quatre Bayou Pass; one at Bastian Bay; three near Bastian Bay.

List of military reservations turned over by the War Department to the Interior Department, or otherwise disposed of by the War Department, etc.—Continued.

Name of post.	Date of relinquishment.	Authority for relinquishment.	Remarks.
Lyon, Fort, Colo	Dec. 2, 1889	Act July 5, 1884	5,874 acres. G. O. 9, A. G. O., 1890.
Mackinac, Fort, Mich.....		Act March 1, 1879.....	Portion to Wendell, Van Allen & Bailey. G. O. 19, 1879.
Mackinac, Fort, Mich., and National Park.	Aug. 3, 1896	Act March 2, 1895.....	Reservation 103.41 acres. Park 821 acres; transferred to State of Michigan. G. O. 13, 1895, and G. O. 49, A. G. O., 1895.
Macomb, Fort, La.....	June 26, 1896	Act July 5, 1884.....	Portion G. O. 26, A. G. O., 1896.
Marcy, Fort, N. Mex.....	June 28, 1895	do	17 acres, 3,425 square yards, 2,656 square feet. G. O. 40, 1895.
McDermitt, Fort, Nev	Dec. 1, 1886	do	Hay reservation, 6,400-acres. War Department circular, Dec. 3, 1886.
Do	July 24, 1889	do	Post reserve, 3,974.40 acres. G. O. 67, A. G. O., 1889.
McGarry Camp, Nev	Mar. 25, 1871	Act Feb. 24, 1871	G. O. 19, A. G. O., 1871.
McDowell, Fort, Ariz	Oct. 1, 1890	Act July 31, 1882 (22 Stat., 181).	Post, buildings, etc., for Indian school purposes until required for military purposes. G. O. 115, A. G. O., 1890.
Do	Mar. 2, 1891	Act July 5, 1884.....	Containing 25,628 acres. G. O. 22, A. G. O., 1891.
McHenry, Fort, Md		Act June 19, 1878.....	Site for a dry dock to Baltimore Dry Dock Co. G. O. 44, A. G. O., 1878.
McKinney, Fort, Wyo.....	Jan. 16, 1889	Act July 5, 1884.....	Portion, estimated, 640 acres. G. O. 5, A. G. O., 1889.
Do	Nov. 14, 1894	do	Military reserve, 24,960 acres. G. O. 63, 1894.
McKinney Depot, Wyo.....	Dec. 7, 1894	do	Camp and grazing reserve, 640 acres. G. O. 19, 1895.
McPherson, Fort, Nebr.....	Jan. 5, 1887	do	19,500 acres. All except national cemetery tract. War Department circular, Jan. 10, 1887.
McRae, Fort, N. Mex	July 22, 1884	do	2,560 acres. G. O. 80, A. G. O., 1884.
Mackinac, Fort, Mich.....		Act March 1, 1879.....	Portion to Messrs. Wendell, Van Allen & Bailey. G. O. 19, A. G. O., 1879.
Maginnis, Fort, Mont	Aug. 14, 1890	Act July 5, 1884.....	31,059.21 acres. G. O. 91, A. G. O., 1890.
Mason, Fort (Point San Jose), Cal.		Act July 1, 1870.....	Portion to the city and county of San Francisco, Cal. G. O. 87, A. G. O., 1870.
Missouri River, Island in, Mo.	July 22, 1884	Act July 5, 1884.....	G. O. 80, A. G. O., 1884.
Mojave, Fort, Ariz.....	Sept. 29, 1890	Act July 31, 1882 (22 Stat., 181).	14,697 acres. Indian school purposes until required for military occupation. G. O. 111, A. G. O., 1890.
Mount Vernon Barracks, Ala.	Mar. 2, 1893	Letter of Secretary of War of Mar. 2, 1893.	All that portion south of Cedar Creek.
Do	Mar. 10, 1895	Act Mar. 1, 1895.....	To State of Alabama for public purposes. G. O. 38, 1895.
Narrows of Puget Sound, Wash.	Nov. 14, 1894	Act July 5, 1884.....	582.1 acres on west side of Narrows at south side of entrance of Gig Harbor. G. O. 63, 1894.
Do	do	do	637.4 acres on west side of Narrows. G. O. 63, 1894.
Do	do	do	635 acres on west side of Narrows south of Point Evans. G. O. 63, 1894.
Do	do	do	569.33 acres on north side of Gig Harbor. G. O. 63, 1894.
Newport Barracks, Ky.....	Jan. 1, 1895	Act July 31, 1894.....	To city of Newport for park purposes.
Niobrara, Fort, Nebr.....	May 9, 1896	Act July 5, 1884.....	Portion. 720 acres. G. O. 19, A. G. O., 1896.
Oglethorpe Barracks, Ga	Apr. 7, 1884	Act Apr. 7, 1882	G. O. 46, A. G. O., 1882.
Oklahoma, Okla.....	Oct. 4, 1892	Act July 5, 1884.....	160 acres. G. O. 69, A. G. O., 1892.
Pagosa Springs (old Fort Lewis, Colo.)	July 22, 1884	do	21,838.08 acres. G. O. 80, A. G. O., 1884.
Pembina, Fort, N. Dak.....	Dec. 2, 1895	do	1,920 acres. G. O. 60, A. G. O., 1895.
Petit Bois Blanc Island, Miss.	Nov. 1, 1895	do	Portion. G. O. 58, A. G. O., 1895.
Pikes Peak, Colo	Jan. 16, 1889	do	8,192 acres. G. O. 5 of 1889.
Pittsburg, Pa	Nov. 8, 1894	Act May 21, 1890.....	Certain land corner Penn ave. and Garrison alley; sold to Charles McKnight.
Plattsburg Barracks, N. Y		Act June 8, 1872.....	25 acres to the New York and Canada R. R. Co. G. O. 66, A. G. O., 1872.

List of military reservations turned over by the War Department to the Interior Department, or otherwise disposed of by the War Department, etc.—Continued.

Name of post.	Date of relinquishment.	Authority for relinquishment.	Remarks.
Plattsburg Barracks, N. Y.		Act June 30, 1879	2 acres, etc., to R. R. co. G. O. 70, A. G. O., 1879.
Point Roberts, Wash.	Sept. 23, 1890	Act July 5, 1884	1,472 acres. G. O. 107, A. G. O., 1890.
Presidio of San Francisco, Cal.		Act May 9, 1876	Portion to city of San Francisco. G. O. 44, A. G. O., 1876.
Randall, Fort, Dak		Act May 18, 1874	Portion. G. O. 47, A. G. O., 1874.
Do.	July 22, 1894	Act July 5, 1884	Portion (24,503.53 acres north of Missouri River) not already transferred under act of May 18, 1874. G. O. 80, A. G. O., 1884.
Do.		Act Oct. 1, 1890 (Public, 348).	Portion open to settlers.
Do.	Oct. 20, 1893	Act July 5, 1884	Remainder, 92,160 acres. G. O. 84, 1893.
Ransom, Fort, N. Dak	July 14, 1890	Act June 10, 1880	G. O. 55, A. G. O., 1880.
Reading, Fort, Cal.		Act Feb. 15, 1881	Restored to public domain. G. O. 25, A. G. O., 1881.
Reno, Fort, Okla.			See Council Grove.
Reynolds, Fort, Colo.	July 18, 1874	Act June 19, 1874	G. O. 88, A. G. O., 1874.
Rice, Fort, S. Dak	July 22, 1884	Act July 5, 1884	Estimated at 102,400 acres. G. O. 80, A. G. O., 1884.
Ridgeley, Fort, Minn		Act July 1, 1870	G. O. 87, A. G. O., 1870.
Riley, Fort, Kans		Joint resolution, Mar. 2, 1867.	Reduced area, etc. G. O. 29, A. G. O., 1867.
Ripley, Fort, Minn.		Act Feb. 28, 1873	Portion. G. O. 28, A. G. O., 1873.
Do.	July 2, 1880	Act Apr. 1, 1880	Restored to public domain. G. O. 22, A. G. O., 1880.
Round Island, Miss.	Nov. 1, 1895	Act July 5, 1884	G. O. 58, A. G. O., 1895.
Robinson, Fort, Nebr	Sept. 22, 1895	do	Portion. G. O. 44, A. G. O., 1895.
Rush Lake Valley, Utah.	July 22, 1894	do	5,131.47 acres. G. O. 80, A. G. O., 1894.
Sabine, Fort, La.	Mar. 25, 1871	Act Feb. 24, 1871	G. O. 19, A. G. O., 1871.
St. Augustine, Fla.	Oct. 15, 1883	Act Aug. 18, 1856 (11 Stat., 88).	0.1619 and 0.12786 acre. Hospital lot and blacksmith's shop lot.
Do.	Mar. 18, 1895	Act July 5, 1884	Old powder-house lot or governor's garden lot, 10.23 acres.
Do.	Nov. 18, 1895	do	Dragoon barracks lot, 1.15 acres. War Department circular, Nov. 20, 1895.
St. Marks, Fla.	Oct. 27, 1892	do	50 acres. G. O. 74, A. G. O., 1892.
St. Michael, Alaska	Apr. 17, 1899	do	Certain portions. G. O. 77, A. G. O., 1899. G. O. 132, 1900.
Sanders, Fort, Wyo		Act June 9, 1874	Reduced area. G. O. 60, A. G. O., 1874.
Do.	Aug. 22, 1884	Act July 5, 1884	19,842 acres. G. O. 102, A. G. O., 1884.
Sedgwick, Fort, Colo. and Nebr.	July 22, 1884	do	40,960 acres. G. O. 80, 1884.
Selden, Fort, N. Mex.	Apr. 9, 1890	Act July 31, 1882 (22 Stat., 181).	G. O. 44, A. G. O., 1890.
Do.	Mar. 30, 1892	Act July 5, 1884	9,613.7381 acres. G. O. 26, A. G. O., 1892.
Seward, Fort, Dak	July 14, 1880	Act June 10, 1880	G. O. 55, A. G. O., 1880.
Shaw, Fort, Mont	Apr. 30, 1892	Act July 31, 1882 (22 Stat., 181).	29,843 acres. G. O. 30, A. G. O., 1892.
Sheridan, Camp, Nebr	July 22, 1884	Act July 5, 1884	18,225 acres. G. O. 80, A. G. O., 1884.
Sherman, Fort, Idaho	Nov. 2, 1900	do	G. O. 132, 1900.
Sidney, Fort, Nebr.	Nov. 14, 1894	Act July 5, 1894	620 acres military reserve; 20 acres on N.E. corner donated by act of June 10, 1892, to city of Sidney, Nebr., for cemetery purposes. G. O. 63, 1894.
Smith, Fort, Ark.	Mar. 21, 1871	Act Feb. 24, 1871	3,195 acres wood and timber reserve. G. O. 63, 1894.
Sisseton, Fort, Dak.	Apr. 22, 1889	Act July 5, 1884	G. O. 19, A. G. O., 1871.
Snelling, Fort, Minn.	Dec. 23, 1873	Act May 7, 1870	81,920 acres. War Department circular, May 1, 1889.
Soldiers, Key, Fla.	July 9, 1870	Act Aug. 18, 1856.	Reduced to 1,531.21 acres. G. O. 66, A. G. O., 1870.
Stambaugh, Camp, Wyo	May 3, 1881		No formal reservation.
Stanton, Fort, N. Mex.	Aug. 7, 1872	Act May 21, 1872	Reduces reservation. G. O. 35, A. G. O., 1872.
Do.	Aug. 17, 1895	Act July 5, 1884	10,240 acres. G. O. 3, A. G. O., 1895.
Spokane, Fort (old), Wash.	Aug. 28, 1899	Act July 31, 1882	To Interior Department for Indian school purposes. G. O. 163, 1899.

List of military reservations turned over by the War Department to the Interior Department, or otherwise disposed of by the War Department, etc.—Continued.

Name of post.	Date of relinquishment.	Authority for relinquishment.	Remarks.
Stellacoom, Fort, Wash.....	.....	Act Apr. 15, 1874.....	Donates portion to Washington for use of insane asylum. G. O. 32, A. G. O., 1874.
Do.....	July 22, 1884.....	Act July 5, 1884.....	289 acres. G. O. 80, A. G. O., 1884.
Stevenson, Fort, Dak.....	Feb. 13, 1896.....	do.....	G. O. 19, 1896.
Sullivan, Fort, Me.....	July 22, 1884.....	do.....	12.5 acres. G. O. 80, A. G. O., 1884.
Summer, Fort, N. Mex.....	Mar. 25, 1871.....	Act Feb. 24, 1871.....	Except national cemetery. G. O. 19, A. G. O., 1871.
Sulphur Creek, Wyo.....	July 22, 1884.....	Act July 5, 1884.....	Coal reservation. G. O. 80, A. G. O., 1884.
Sully, Fort, S. Dak.....	Nov. 14, 1894.....	do.....	25,984 acres. G. O. 63, 1894.
Supply, Fort, Okla.....	.....	do.....	40,320 acres. G. O. 63, 1894.
Sucia Island, Wash.....	Dec. 18, 1896.....	do.....	Portion to Interior Department. G. O. 52, A. G. O., 1896.
Thornburg, Fort, Utah.....	Nov. 14, 1884.....	do.....	21,851 acres. G. O. 80, A. G. O., 1884.
Thomas, Fort, Ariz.....	Dec. 2, 1892.....	do.....	10,487 acres. G. O. 81, A. G. O., 1892.
Three Forks, Owyhee, Camp, Idaho.....	July 22, 1884.....	do.....	4,800 acres. G. O. 80, A. G. O., 1884.
Totten, Fort, Dak.....	Oct. 1, 1890.....	Act July 31, 1892 (22 Stat., 181). ..	Post, buildings, etc., for Indian school purposes until required for military purposes. G. O. 115, A. G. O., 1890.
Union, Fort, N. Mex.....	Apr. 1, 1894.....	Sec. of War, Feb. 16, 1894.....	Private property. Buildings and grounds totally abandoned by U. S.
Uncompahgre, Cantonment, on Colorado.....	July 22, 1884.....	Act July 5, 1884.....	Portion, 4,000 acres. G. O. 80, A. G. O., 1884.
Verde, Fort, Ariz.....	.....	do.....	Garden tract, 3,000 acres. G. O. 80, A. G. O., 1884.
Do.....	Oct. 14, 1890.....	do.....	9,233.79 acres. G. O. 123, A. G. O., 1890.
Wallace, Fort, Kans.....	July 22, 1884.....	do.....	8,926.09 acres. G. O. 80, A. G. O., 1884.
Walla Walla, Fort, Wash.....	Oct. 26, 1875.....	Act Apr. 29, 1872.....	Portion of hay reserve. G. O. 35, A. G. O., 1872.
Do.....	May 3, 1880.....	Act June 8, 1872.....	Remainder of hay reserve.
Do.....	Oct. 26, 1875.....	do.....	Timber reserve. G. O. 66, A. G. O., 1872.
Do.....	May 3, 1880.....	do.....	Portion of post reservation.
Wallen, Camp, Ariz.....	Apr. 22, 1874.....	do.....	No formal reservation.
Washita, Fort, Ind. T.....	July 1, 1870.....	do.....	Do.
Waterford, Pa.....	.....	Act Mar. 4, 1868.....	.....
Wayne, Fort, Ark.....	Mar. 25, 1871.....	Act Feb. 24, 1871.....	G. O. 19, A. G. O., 1871.
Whipple Barracks, Ariz.....	Oct. 21, 1875.....	Act June 22, 1874.....	Portion. G. O. 88, A. G. O., 1874.
Do.....	July 22, 1884.....	Act July 5, 1884.....	Timber reserve, 720 acres. G. O. 80, A. G. O., 1884.
White River, Camp, on Colorado.....	.....	do.....	40,960 acres. G. O. 80, A. G. O., 1884.
Wilkins, Fort, Mich.....	.....	do.....	148.35 acres. G. O. 80, A. G. O., 1884.
Willow Grove, Camp, Ariz.....	Apr. 22, 1874.....	.....	No formal reservation.
Wilmington Depot, Cal.....	.....	Act Feb. 25, 1873.....	To be reconveyed to Banning and Wilson. G. O. 45, A. G. O., 1875.
Yuma, Fort, Ariz.....	Dec. 7, 1874.....	Act June 22, 1874.....	Portion. G. O. 88, A. G. O., 1874.
Yuma, Fort, Ariz. and Cal.....	Jan. 9, 1884.....	.....	Indian school purposes.
Do.....	July 22, 1884.....	Act July 5, 1884.....	G. O. 80, A. G. O., 1884.
Zarah, Fort, Kans.....	Mar. 25, 1871.....	Act Feb. 24, 1871.....	G. O. 19, A. G. O., 1871.

MANILA.

Among the stores and supplies furnished for troops serving in the Philippines during fiscal year, mention may be made of 274 Waterhouse-Forbes sterilizers, with various extra fittings. These sterilizers cost approximately \$100 each, and a description thereof will be found on page 169, Quartermaster-General's Report of 1900; also 2,500 feet of garden hose, 125 stocks and dies, 1,000 pounds asbestos packing, 500 hand grenades, odorless wagon fittings, etc.

Maj. L. S. Roudiez, quartermaster, U. S. V., in charge of the con-

struction of the large refrigerating plant at Manila, reports under date of June 30, 1901:

The work of construction is practically completed. Making of ice has been going on for nearly three weeks and cold storage to the extent of about 130,000 cubic feet has been supplied the Subsistence Department for over a month.

The success of the enterprise is no longer questioned. The work speaks for itself and the results are apparent to all. The cost of operating the plant will not be out of proportion to the revenue obtained for the duty performed. As a matter of fact, this plant will pay for itself in a very few years.

Under orders of the honorable Secretary of War this plant has been transferred to the civil government, and all ice and cold storage required for the army is purchased from it under contracts.

A large distilling plant of 3,800 gallons per day capacity, with various spare parts, was procured at approximate cost of \$3,666 and sent forward for use in China, but it afterwards appearing that it was not required there, it was shipped to Manila, and after full conference between chief quartermaster and chief medical officer was set up at Dagupan, P. I.

Four other large and 6 small condensing plants have been supplied; also 6 additional 25-horsepower boilers and 10 pumps at approximate cost of \$24,700.

DESCRIPTION.

Large. (Capacity, each, 3,800 gallons per day of twenty-four hours). Three distillers; 8 25-horsepower boilers; 3, each, feed and circulating pumps; storage tanks; filter tanks; piping and fittings complete.

Small. (Capacity, 600 gallons each twenty-four hours.) Including with each plant boiler, feed pump, water-supply pump with 150 feet suction hose, water-supply tank, 2 filters, 1 sponge filter, condensing and pumping apparatus, 400-gallon storage tank, etc.

Call having been made for a hospital laundry plant at Manila, the Secretary of War authorized the utilization of parts of two plants formerly in use at Josiah Simpson Hospital, Virginia, and at Montauk Point, New York, and the purchase of additional machinery necessary to make a complete plant, capable of washing 6,000 pieces or more per day, all expense being borne from the funds of the Medical Department.

CHINA.

Fifty Waterhouse-Forbes sterilizers were supplied during the year, 32 of which were subsequently sent to Manila.

Also 6 distilling plants of 600 gallons capacity each of twenty-four hours at approximate cost of \$11,000. Each plant consisted of boiler, feed and supply pump, suction hose, supply and storage tank, 2 filters, 1 storage filter, condensing and pumping apparatus, etc.

ALASKA.

Among the various stores furnished for use at Forts St. Michael, Gibbon, Davis, and Egbert, mention may be made of three 4,000-gallon wooden tanks, 10 upright wooden water tanks, 1 steam pump, and various quantities of lumber, pipe, plugs, tees and ells, hose, extinguishers, packing, etc.

DEEP WELLS.

Authority has been given during the fiscal year for the sinking of wells at—

Fort Bliss, Tex.	Fort Keogh, Mont.
Fort Baker, Cal.	Fort Lincoln, N. Dak.
Fort Carroll, Md.	Fort Michie, N. Y.
Fort Dade, Fla.	Fort Morgan, Ala.
Fort De Soto, Fla.	Fort Pickens, Fla.
Fort Fremont, S. C.	Presidio of San Francisco, Cal.
Fort Flagler, Wash.	Fort Screven, Ga.
Fort Greble, R. I.	Fort Stevens, Oreg.
Fort Huachuca, Ariz.	Honolulu, H. I.
Army and Navy Hospital, Hot Springs, Ark.	Fort Washington, Md.

Authority has been given during the fiscal year for the installing of water systems at—

Fort Baker, Cal.	Fort Lincoln, N. Dak.
Fort Du Pont, Del.	Fort Mott, N. J.
Fort Greble, R. I.	Fort Rodman, Mass.
Fort Howard, Md.	Fort Stevens, Oreg.

Of sewer systems at—

Fort Baker, Cal.	Fort Point, Cal.
Fort Du Pont, Del.	Fort Rodman, Mass.
Fort Howard, Md.	Fort Sam Houston, Tex.
Fort Lincoln, N. Dak.	Fort Washington, Md.
Fort Mott, N. J.	

Water, sewer, and plumbing repairs and improvements of various character have been authorized during the year at posts throughout the country.

Electric wiring has been installed in buildings at the new seacoast posts with view of lighting same from the fortification plants.

At Forts Monroe, Preble, Banks, Key West Barracks, Jackson Barracks and general hospital, and Washington Barracks, D. C., electric current is purchased for lighting purposes.

All necessary repairs to and installation of heating plants at the different posts have been duly made, and at general hospital, Hot Springs, Ark., extensive overhauling of plumbing and heating plants has been under way, as well as new installations. An electric plant and laundry have also been provided.

Requisite repairs to heating, lighting, plumbing, and laundry of general hospital, Presidio, have been made.

While the appropriations of the department have not been sufficient to meet in full the many calls from various posts throughout the country for water, sewer, plumbing, lighting, and heating improvements, repairs, etc., all reasonable and absolute requirements, after careful study and consideration, have been fully and promptly met.

The various expenditures made through this branch of the office will be found of record among the tables and totals given in report of the construction and repair division, to which attention is invited.

F. G. HODGSON,
Major and Quartermaster, U. S. A.

The ACTING QUARTERMASTER-GENERAL, U. S. A.,
Washington, D. C.

WAR DEPARTMENT,
QUARTERMASTER-GENERAL'S OFFICE,
Washington, D. C., August 15, 1901.

GENERAL: I have the honor to submit a report of the operations of the inspection branch of this office for the fiscal year ending June 30, 1901.

The business transacted in this branch of the office pertains principally to the personnel of the Department, which includes the officers, post quartermaster-sergeants, army service detachment at West Point, and civilian employees.

OFFICERS OF THE QUARTERMASTER'S DEPARTMENT.

Prior to February 2, 1901, the organization of the Quartermaster's Department, so far as the number of officers is concerned, consisted of the following:

Regular establishment:

Quartermaster-General, with rank of brigadier-general.....	1
Assistant quartermasters-general, with rank of colonel.....	4
Deputy quartermasters-general, with rank of lieutenant-colonel.....	8
Quartermasters, with rank of major.....	14
Assistant quartermasters, with rank of captain.....	30
Military storekeeper, with rank of captain.....	1
Total.....	58

Volunteer establishment:

Quartermasters, with rank of major.....	30
Assistant quartermasters, with rank of captain.....	40
Total.....	70

Grand total, regular and volunteer..... 128

Under section 16 of act of Congress approved February 2, 1901, the following officers were provided for this department:

Regular establishment:

Quartermaster-General, with rank of brigadier-general.....	1
Assistant quartermasters-general, with rank of colonel.....	6
Deputy quartermasters-general, with rank of lieutenant-colonel.....	9
Quartermasters, with rank of major.....	20
Quartermasters, with rank of captain.....	60
Military storekeeper, with rank of captain.....	1
Total.....	97

Volunteer establishment:

Assistant quartermasters, with rank of captain.....	24
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Grand total..... 121

It was further provided in the last-mentioned law—

That to fill original vacancies in the grade of captain created by this act, in the Quartermaster's Department, the President is authorized to appoint officers of volunteers commissioned in the Quartermaster's Department since April twenty-first, eighteen hundred and ninety-eight: *Provided further*, That the President is authorized to continue in service, during the present emergency, for duty in the Philippine Islands and on transports, twenty-four captains and assistant quartermasters of volunteers. This authority shall extend only for the period when their services shall be absolutely necessary.

By act approved March 2, 1901, it is provided—

That appointments to fill original vacancies in the * * * grade of captain in the Quartermaster's Department * * * may be made from officers of volunteers commissioned since April twenty-first, eighteen hundred and ninety-eight. * * *

The position of military storekeeper, Quartermaster's Department, was discontinued by operation of law, the incumbent thereof retiring from active service, on account of age, on January 12, 1901.

Between the date of the passage of the act of February 2, 1901, and the close of the fiscal year, all officers of the Quartermaster's Department holding volunteer commissions were discharged from the volunteer service, leaving only the 96 officers of the regular establishment for the performance of the duties of the department. None of the 24 captains and assistant quartermasters of volunteers authorized to be retained during the present emergency for duty in the Philippines and on transports were continued in service after June 30, 1901.

The increase in the number of officers in the grades of colonel, lieutenant-colonel, major, and captain, authorized by the new organization, created 39 original vacancies, which permitted the promotion of 9 efficient and worthy officers of this department, and the appointment in the regular service of 39 officers as captain and quartermaster. Up to the close of the fiscal year there had been appointed to the latter position 1 line officer of the regular establishment, 26 of the most efficient volunteer quartermasters, and 10 other persons who had been commissioned in the volunteer service since April 21, 1898.

A full list of the officers serving in this department on July 1, 1901, giving their rank and station, and also a list giving the names of all officers of the Quartermaster's Department holding volunteer commissions who were discharged from the volunteer service from August 15, 1900, to June 30, 1901, is submitted with this report.

At the close of the fiscal year the 96 regular officers provided for this department were distributed for duty as follows:

In service in—	
Alaska	1
Cuba	5
China	1
Hawaii	1
Japan (Nagasaki)	1
In service or under orders for Philippines	22
In service in Porto Rico	1
In transport service	16
In service at general depots, eight military departments, on construction duty, at military posts in United States, and on duty in Quartermaster-General's Office	42
Unassigned	2
On sick leave	2
Vacancies	2
Total	96

Since the date of my last annual report the department has suffered the loss of one of its promising young volunteer officers—Capt. Raymond Sulzer, assistant quartermaster, U. S. V., died in San Francisco Harbor, February 3, 1901, just as the transport from the Philippines reached the harbor, bringing him to his native land. This officer, though young in years and service, had shown himself to be a capable and efficient officer.

On March 2, 1901, Capt. Edgar S. Dudley, assistant quartermaster, U. S. A., was appointed major and judge-advocate in the Regular Army, thereby severing his connection with the Quartermaster's Department.

Attention is invited to the following provisions contained in section 26, act of Congress approved February 2, 1901, concerning the Quartermaster's and other staff departments:

Sec. 26. That so long as there remain any officers holding permanent appointments in the Adjutant-General's Department, the Inspector-General's Department, the Quartermaster's Department, the Subsistence Department, the Pay Department, the Ordnance Department, and the Signal Corps, including those appointed to original vacancies in the grades of captain and first lieutenant under the provisions of sections sixteen, seventeen, twenty-one, and twenty-four of this act, they shall be promoted according to seniority in the several grades, as now provided by law, and nothing herein contained shall be deemed to apply to vacancies which can be filled by such promotions or to the periods for which the officers so promoted shall hold their appointments, and when any vacancy, except that of the chief of the department or corps, shall occur, which can not be filled by promotion as provided in this section, it shall be filled by detail from the line of the Army, and no more permanent appointments shall be made in those departments or corps after the original vacancies created by this act shall have been filled. Such details shall be made from the grade in which the vacancies exist, under such system of examination as the President may from time to time prescribe.

All officers so detailed shall serve for a period of four years, at the expiration of which time they shall return to duty with the line, and officers below the rank of lieutenant-colonel shall not again be eligible for selection in any staff department until they shall have served two years with the line.

That when vacancies shall occur in the position of chief of any staff corps or department the President may appoint to such vacancies, by and with the advice and consent of the Senate, officers of the Army at large not below the rank of lieutenant-colonel, and who shall hold office for terms of four years. When a vacancy in the position of chief of any staff corps or department is filled by the appointment of an officer below the rank now provided by law for said office, said chief shall, while so serving, have the same rank, pay, and allowances now provided for the chief of such corps or department. And any officer now holding office in any corps or department who shall hereafter serve as chief of a staff corps or department and shall subsequently be retired shall be retired with the rank, pay, and allowances authorized by law for the retirement of such corps or department chief: *Provided*, That so long as there remain in service officers of any staff corps or department holding permanent appointments, the chief of such staff corps or department shall be selected from the officers so remaining therein.

OFFICERS DETAILED FOR DUTY IN THE QUARTERMASTER'S DEPARTMENT.

Under authority contained in the above-mentioned provision, three officers, at the close of the fiscal year, had been detailed from the line of the Army for duty in the Quartermaster's Department for a period of four years, to fill vacancies in this department.

POST QUARTERMASTER-SERGEANTS.

Under act approved February 2, 1901, Congress authorized 150 post quartermaster-sergeants, an increase of 45 over the number previously authorized. This increase has enabled the department to appoint a number of these sergeants and assign them to duty in the Philippines and at other points where their services were urgently required. At the close of the fiscal year there were 138 of these sergeants in service. The remaining vacancies will be filled from the most efficient applicants who are from time to time designated for examination for the position.

DETACHMENT OF ARMY-SERVICE EMN, QUARTERMASTER'S DEPARTMENT,
WEST POINT, N. Y.

Maj. John B. Bellinger, quartermaster, U. S. A., reports in reference to this detachment as follows:

Number of men in detachment July 1, 1900	139
Number of men transferred or discharged during fiscal year ended June 30, 1901, including one man omitted last year.....	52
	<hr/>
	87
Number of men enlisted in and transferred to detachment during fiscal year ended June 30, 1901	53
Number of vacancies June 30, 1901	1
	<hr/>
Total	141

The commanding officer of this detachment reports that all the members thereof have performed their work in a satisfactory manner during the fiscal year.

CIVILIAN EMPLOYEES, QUARTERMASTER'S DEPARTMENT AT LARGE.

The subject of employees was given careful attention during the past fiscal year, and wherever possible the force has been reduced to the lowest limit consistent with the best public interests.

Based upon a report of a board of officers sent to Porto Rico to investigate the question of civilian employees at that place, a large reduction in said employees has been effected and steps taken to classify under civil-service rules, from July 1, 1901, such of the war emergency employees on duty there who entered the service prior to and on May 29, 1899, and whose continued services were found to be necessary. This action, when consummated, will make the civilian employees of this department serving in Porto Rico subject to civil-service rules the same as all other classified employees.

By reason of the discontinuance on June 30, 1901, of the army transports running between New York, Cuba, and Porto Rico, large reductions of war emergency employees on duty on said transports and in connection with the transport service in New York City have been made and steps taken to close up the transport service at that place. Further reductions will be made from time to time in the force of employees hired in connection with that work, until the business relating thereto is entirely completed.

The embarrassment caused by the restrictions and limitations in the laws enacted prior to the war with Spain, covering the number of civilian employees paid from the appropriations of the Quartermaster's Department and the maximum salary and aggregate amount to be paid therefor, was relieved by the following provision, contained in the act approved March 2, 1901 (army appropriation bill):

That the number of and total sum paid for civilian employees in the Quartermaster's Department, including those paid from the funds appropriated for regular supplies, incidental expenses, barracks and quarters, army transportation, clothing, camp and garrison equipage, shall be limited to the actual requirements of the service, and that no employee paid therefrom shall receive a salary of more than one hundred and fifty dollars per month, except upon the approval of the Secretary of War.

EMPLOYEES, QUARTERMASTER-GENERAL'S OFFICE.

There are 218 clerks and other employees provided for this office. Of this number 120 are permanent employees; the remaining 98 belong to the temporary force.

The clerical work connected with this office is important and very voluminous, and as a rule the clerical force, both regular and temporary, have rendered very efficient and satisfactory service. A large part of the temporary clerks have now had two or more years' experience in the work of this office, and as their efficiency is constantly increasing it is believed that it will be for the best interests of this office and the public service to absorb into the regular force a portion of these temporary employees. Otherwise the most efficient of them will undoubtedly seek and secure permanent places elsewhere, as opportunity occurs, resulting in the loss of their experience and training to this office. I therefore recommend that such action be taken to induce Congress, at its next session, to provide for the permanent appointment of at least 50 per cent of the temporary force of this office. The remaining 50 per cent can be retained in their temporary character for another year, or until it can be definitely determined how long their services may be required.

Since the beginning of the Spanish-American war the work of this office has increased to a large extent, thereby entailing upon some of the principal clerks much additional and responsible work. They have performed their enlarged and important duties, without any increase in pay, in a most efficient and creditable manner. In my judgment, at least four of these principal clerks should be increased from their present rating of \$1,800 to \$2,000 per annum; and, familiar as I am with the importance of their work and the innumerable details with which they are charged, I can not too strongly recommend this deserved increase to your most favorable consideration, with the hope that action may be taken to accomplish this at the next session of Congress.

Very respectfully,

F. M. SCHREINER,

Captain and Quartermaster, U. S. A.

The QUARTERMASTER-GENERAL OF THE ARMY.

List of quartermasters, U. S. Volunteers, who have been mustered out of volunteer service since last report.

Name.	Rank.	Actual date of muster out.
Charles M. Augur	Captain and assistant quartermaster	Jan. 11, 1901
Walter Allen	do	June 30, 1901
D. W. Arnold	do	Do.
Abraham S. Bickham	Major and quartermaster	May 1, 1901
John C. W. Brooks	do	June 30, 1901
Robert L. Brown	Captain and assistant quartermaster	Do.
Laurance C. Baker	do	Mar. 1, 1901
John J. Bradley	do	Jan. 31, 1901
Charles T. Baker	do	June 30, 1901
Archibald W. Butt	do	Do.
Walter W. Barker	do	Do.
Jesse M. Baker	do	Do.
Nathan P. Batchelder	do	Do.
J. Y. Mason Blunt	do	Nov. 30, 1900
Chauncey B. Baker	Major and quartermaster	June 30, 1901
George G. Bailey	Captain and assistant quartermaster	Do.
George C. Barnhardt	do	Mar. 21, 1901
Robert M. Brookfield	do	Oct. 16, 1900
Edward C. Brooks	Major and quartermaster	May 1, 1901
Noble H. Creager	do	June 30, 1901
William M. Coulling	Captain and assistant quartermaster	Do.
William C. Cannon	do	Do.
Harry B. Chamberlin	do	Do.
William C. R. Colquhoun	do	Do.
Thomas Downs	do	Do.
Jeremiah Z. Dare	do	Apr. 26, 1901

List of quartermasters, U. S. Volunteers, who have been mustered out of volunteer service since last report—Continued.

Name.	Rank.	Actual date of musterout.
Peter W. Davison	Captain and assistant quartermaster	Mar. 21, 1901
William C. Davis	do	June 30, 1901
William M. Ekin	do	Do.
Ira L. Fredendall	do	Do.
George L. Goodale	do	Do.
Louis F. Garrard, jr	do	Do.
John Gibbon, jr	do	Do.
Alvan C. Gillem	do	Do.
Kensay J. Hampton	do	Do.
Morris C. Hutchins	Major and quartermaster	Do.
Samuel V. Ham	Captain and assistant quartermaster	Mar. 21, 1901
William E. Horton	do	June 30, 1901
William G. Haan	do	Mar. 23, 1901
William H. Hay	do	Mar. 15, 1901
George Le R. Irwin	do	Mar. 21, 1901
Amos W. Kimball	do	June 30, 1901
Cyril W. King	do	Feb. 15, 1901
Eugene F. Ladd	Major and quartermaster	June 30, 1901
Jacques de L. Lafitte	Captain and assistant quartermaster	Jan. 31, 1901
Thomas B. Lamoreux	do	June 30, 1901
James S. Michael	do	May 1, 1901
Henry J. May	do	June 30, 1901
Perry L. Miles	do	Mar. 21, 1901
Edward C. McDowell	do	June 30, 1901
Marion M. McMillin	do	Do.
John W. McHarg	do	Do.
Patrick H. McCaul	do	Do.
Sylvanus G. Orr	do	Do.
Elias H. Parsons	do	Do.
Alexander W. Perry	do	Mar. 21, 1901
Jonathan N. Patton	do	June 30, 1901
George W. Povey	do	Do.
Harry L. Pettus	do	Do.
Leon S. Roudiez	Major and quartermaster	Do.
Francis M. Schreiner	do	May 1, 1901
Thomas Swobe	Captain and assistant quartermaster	June 30, 1901
Charles G. Sawtelle, jr	do	April 13, 1901
William S. Scott	do	June 30, 1901
Charles J. Symmonds	do	Mar. 21, 1901
Lewis V. Williams	do	June 30, 1901
Moses Walton, jr	do	Do.
James L. Wilson	Major and quartermaster	May 1, 1901
William J. White	do	June 30, 1901
Pegram Whitworth	Major and assistant quartermaster	Mar. 21, 1901
Haldimand P. Young	Captain and quartermaster	May 17, 1901

List of quartermasters, U. S. Army, holding volunteer commissions who have been mustered out of volunteer service since last report.

Name.	Volunteer rank.	Actual date of musterout.
James B. Aleshire	Major and quartermaster	May 1, 1901
Charles Bird	Brigadier-general	June 20, 1901
Gonzalez S. Bingham	Major and quartermaster	June 30, 1901
John B. Bellinger	do	May 17, 1901
Joseph C. Byron	do	May 1, 1901
John M. Carson, jr	do	Do.
Thomas Cruse	do	Do.
Carroll A. Devo	do	Do.
John T. French	do	Apr. 3, 1901
Frederick G. Hodgson	do	Mar. 19, 1901
Samuel R. Jones	do	Oct. 31, 1900
John T. Knight	do	May 1, 1901
Oscar F. Long	Major and quartermaster	Mar. 13, 1901
Isaac W. Littell	Brigadier-general	June 20, 1901
William H. Miller	Major and quartermaster	May 1, 1901
Medad C. Martin	do	Aug. 11, 1900
Daniel E. McCarthy	do	May 17, 1901
William W. Robinson, jr	do	May 1, 1901
Robert R. Stevens	do	Nov. 13, 1900
J. Estcourt Sawyer	do	May 17, 1901
Charles B. Thompson	do	Mar. 11, 1901
Frederick Von Schrader	do	Feb. 2, 1901
		Mar. 29, 1901

Roster showing stations and duties of officers of the Quartermaster's Department, U. S. Army, July 1, 1901.

Name and grade.	Stations and duties.	Since—
QUARMASTER-GENERAL.		
<i>With rank of brigadier-general.</i>		
Ludington, M. I	Washington, D. C.; temporarily absent on tour of inspection in the Philippines.	
ASSISTANT QUARTERMASTERS-GENERAL.		
<i>With rank of colonel.</i>		
Moore, James M	Chief quartermaster, Department of the East, Governors Island, New York Harbor.	Nov. 22, 1899
Kimball, Amos S	Washington, D. C.; Acting Quartermaster-General during absence of the Quartermaster-General, since July 1, 1901. Also in charge of the general depot of the Quartermaster's Department, New York City, since Apr. 7, 1897, and of business pertaining to transport service in New York City relating to transports sailing between New York and Manila, Philippine Islands, since July 1, 1901.	
Furey, John V	Philadelphia, Pa.; in charge general depot, Quartermaster's Department.	Mar. 5, 1896
Atwood, Edwin B	Chicago, Ill.; chief quartermaster Department of the Lakes.	July 15, 1900
Marshall, James M	San Francisco, Cal.; chief quartermaster Department of California.	Nov. 18, 1898
Simpson, John	San Antonio, Tex.; chief quartermaster Department of Texas, and post quartermaster at Fort Sam Houston, Tex.; under orders to be relieved by Lieut. Col. John L. Clem, deputy quartermaster-general.	Apr. 7, 1900
DEPUTY QUARTERMASTERS-GENERAL.		
<i>With rank of Lieutenant-Colonel.</i>		
Humphrey, Chas. F	Manila, Philippine Islands; chief quartermaster Division of the Philippines.	July 1, 1901
Wheeler, Daniel D	St. Louis, Mo.; in charge general depot, Quartermaster's Department; also in charge, under instructions of Quartermaster-General, of construction at Jefferson Barracks, Mo.	Oct. 9, 1899
Barnett, Chas. R	Jeffersonville, Ind.; in charge general depot, Quartermaster's Department; also in charge of quartermaster's establishment, Chickamauga Park, Ga., since March 31, 1901.	Apr. 30, 1897
McCauley, Chas. A. H	Philadelphia, Pa.; assistant to depot quartermaster; under orders to proceed to San Francisco, Cal.; thence to Manila, Philippine Islands, reporting to commanding general, Division of the Philippines, for duty.	Apr. 17, 1896
Hathaway, Forrest H	Omaha, Nebr.; under orders to proceed to San Francisco, Cal.; thence to Manila, Philippine Islands, reporting to commanding general, Division of the Philippines, for duty.	
Jacobs, Joshua W	Vancouver Barracks, Wash.; chief quartermaster Department of the Columbia and disbursing quartermaster, Portland, Oreg.	Feb. 3, 1899
Bird, Charles	Washington, D. C.; on duty in Quartermaster-General's Office; in charge of matters pertaining to rail and water transportation, including army transport service.	June 21, 1895
Clem, John L	San Juan, Porto Rico; chief quartermaster District of Porto Rico. Under orders for duty as chief quartermaster Department of Texas, San Antonio, Tex., and quartermaster at Fort Sam Houston, Tex.	May 2, 1899

Roster showing stations and duties of officers of the Quartermaster's Department, U. S. Army, July 1, 1901—Continued.

Name and grade.	Stations and duties.	Since—
DEPUTY QUARTERMASTERS-GENERAL—continued.		
<i>With rank of Lieutenant-Colonel—Continued.</i>		
Patten, Wm. S.	Washington, D. C.: on duty in Quartermaster-General's Office; in charge of matters pertaining to clothing, camp and garrison equipage, finance, money accounts, returns of quartermasters' supplies, national cemeteries, etc.	May 15, 1898
QUARTERMASTERS.		
<i>With rank of Major.</i>		
Pond, George E.	St. Paul, Minn.; chief quartermaster Department of Dakota; also in charge of construction of water and sewer system, etc., at Bismarck, N. Dak.	Mar. 17, 1899
Pullman, John W.	Omaha, Nebr.; chief quartermaster Department of the Missouri.	June 15, 1901
Pope, James W.	Denver, Colo.; chief quartermaster Department of the Colorado.	Aug. 8, 1900
Jones, Francis B.	Quartermaster and acting commissary of subsistence on U. S. transport Buford.	June 30, 1901
Miller, Crosby P.	Manila, Philippine Islands; to retain station at Manila until completion of his annual report; thence to San Francisco, Cal.; on arrival to report by telegraph to Quartermaster-General of the Army for further instructions.	Aug. 31, 1899
True, Theo. E.	Washington, D. C.; in charge general depot, Quartermaster's Department; also in charge of quartermaster's establishment at St. Asaph, Va.	Apr. 22, 1893
Hyde, John McE.	Nagasaki, Japan; depot quartermaster; under orders to be relieved by Capt. John Baxter, jr., quartermaster; then to proceed to Manila, Philippine Islands, reporting to commanding general, Division of the Philippines, for assignment to duty.	Dec. 5, 1899
Ruhlen, George.	Seattle, Wash.; in charge of construction and other quartermaster's duties.	Sept. 28, 1900
Miller, Wm. H.	Boston, Mass.; quartermaster; also in charge, under direction of the Quartermaster-General, of the purchase and manufacture of quartermaster supplies for which contracts are awarded at Boston, Mass.	Oct. 1, 1900
Jones, Samuel R.	Governors Island, New York Harbor; assistant to chief quartermaster Department of the East and quartermaster at Fort Columbus, N. Y.	Dec. 5, 1899
Robinson, Wm. W., jr.	Honolulu, H. I.; depot quartermaster and in charge of transport service, under instructions of Quartermaster-General.	Feb. 9, 1901
Martin, Medad C.	Washington, D. C.; on duty in Quartermaster-General's Office; in charge of matters pertaining to hire, purchase, construction of barracks, quarters, storehouses, etc.	June 29, 1896
Long, Oscar F.	San Francisco, Cal. Assistant to depot quartermaster, Sept. 25, 1896, to Aug. 10, 1898, in charge of general depot since Aug. 10, 1898, and general superintendent of army transport service since Feb. 15, 1899.	Sept. 25, 1896
Von Schrader, Frederick.	New York City; assistant to depot quartermaster.	Sept. 15, 1899
Sawyer, J. Estcourt.	Under orders to proceed to Manila, Philippine Islands, reporting to commanding general, Division of the Philippines, for assignment to duty.	

Roster showing stations and duties of officers of the Quartermaster's Department, U. S. Army, July 1, 1901—Continued.

Name and grade.	Stations and duties.	Since—
QUARTERMASTERS—continued.		
<i>With rank of Major—Continued.</i>		
Stevens, Robt. R.....	Manila, Philippine Islands; chief quartermaster Department of Northern Luzon.	Oct. 24, 1899
Hodgson, Frederick G.....	Washington, D. C.; on duty in Quartermaster-General's Office; in charge of matters pertaining to water supply, sewerage, lighting, heating, etc.	Oct. 1, 1897
Bellinger, John B.....	West Point, N. Y.; quartermaster and disbursing officer, United States Military Academy.	June 5, 1900
French, John T., jr.....	Chicago, Ill.; assistant to chief quartermaster Department of the Lakes.	May 28, 1900
Alshire, James B.....	Philippine Islands; quartermaster, in charge of army transport service, Manila, Philippine Islands, as shown by last report.	Mar. 30, 1901
<i>With rank of Captain.</i>		
Littell, Isaac W.....	Manila, Philippine Islands; chief quartermaster Department of Southern Luzon.	Oct. 24, 1899
Bingham, Gonzalez S.....	Fort St. Michael, Alaska; chief quartermaster Department of Alaska.	Apr. 3, 1900
Devol, Carroll A.....	New York City; closing up business relating to army transport service in New York City and in charge of repairs to transports and the care and disposition of same, etc.	July 1, 1901
Cruse, Thomas.....	Philippine Islands; depot quartermaster, Manila, Philippine Islands, as shown by last report.	Nov. 23, 1900
McCarthy, Daniel E.....	Fort Leavenworth, Kans.; in charge of construction, under instruction of the Quartermaster-General; also in charge of all repairs, etc., to barracks and quarters and the improvement of roads at the post.	May 1, 1900
Knight, John T.....	Washington, D. C.; on temporary duty, under instructions of Quartermaster-General; on leave of absence on surgeon's certificate three months from June 7, 1901.	Apr. 10, 1901
Carson, John M., jr.....	Washington, D. C.; on duty in Quartermaster-General's Office; assistant in connection with construction of barracks and quarters.	Mar. 5, 1900
Palmer, Alfred M.....	New York City; engaged in transferring his accountability to Capt. C. A. Devol, quartermaster; on completion to report by letter to Quartermaster-General for further instructions.	
Baxter, John, jr.....	St. Louis, Mo.; on temporary duty at general depot of the Quartermaster's Department; under orders to proceed to San Francisco, Cal., thence to Manila, Philippine Islands, reporting to commanding general Division of the Philippines for assignment to duty as quartermaster at Nagasaki, Japan.	Nov. 24, 1900
Zalinski, Moses G.....	On leave of absence on surgeon's certificate, two months from May 5, 1901.	
Byron, Joseph C.....	Constructing quartermaster, Peking, China.....	May 23, 1900
Wood, Winthrop S.....	Manila, Philippine Islands; quartermaster.....	June 5, 1901
Williamson, George McK.....	Philadelphia, Pa.; on temporary duty at Schuylkill Arsenal.	Feb. 20, 1900
Sewell, Robert.....	Schuylkill Arsenal, Philadelphia, Pa.....	Mar. 17, 1900
Slavens, Thomas H.....	Philippine Islands..... Purchasing, issuing, and disbursing officer for the bureaus of civil administration, Manila, Philippine Islands, as shown by last report.	Nov. 13, 1899

QUARTERMASTER-GENERAL.

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Roster showing stations and duties of officers of the Quartermaster's Department, U. S. Army, July 1, 1901—Continued.

Name and grade.	Stations and duties.	Since—
QUARTERMASTERS—continued.		
<i>With rank of Captain—Continued.</i>		
Stanley, David S	Quartermaster and acting commissary of subsistence on U. S. transport Warren.	Apr. 19, 1901
Schofield, Richmond McA	Quartermaster and acting commissary of subsistence on U. S. transport Meade.	Nov. 30, 1900
Yates, Arthur W	New York City; engaged in transferring accountability, etc.; under orders for duty at Portland, Me., to assume charge, under instructions of Quartermaster-General, of the construction of public buildings at such posts in Portland Harbor as may be assigned him.	
Crabbe, Joseph T.	Isabela de Sagua, Cuba; under orders for duty at San Juan, Porto Rico, to relieve Lieut. Col. J. L. Clem, deputy quartermaster-general.	
Patton, Jonathan N	Quartermaster and acting commissary of subsistence on U. S. transport Logan.	Sept. 20, 1899
Sternberg, Theodore	Quartermaster and acting commissary of subsistence on U. S. transport Samoa.	June 26, 1901
Kimball, Amos W	Quartermaster; Presidio of San Francisco, Cal., temporarily.	May 18, 1899
Horton, Wm. E.	Philippine Islands..... Assistant to chief quartermaster Division of the Philippines, Manila, Philippine Islands, as shown by last report.	Aug. 21, 1899
Cheatham, B. F	En route to Manila, Philippine Islands, reporting to commanding-general, Division of the Philippines, for duty.	
Schreiner, Francis M	Washington, D. C.; on duty in Quartermaster General's Office; in charge of matters pertaining to the personnel of officers of the Quartermaster's Department, and of matters relating to civilian employees on duty in Quartermaster's Department at large, post quartermaster-sergeant, etc.	May 26, 1898
Young, Haldimand P	Newport, R. I.; in charge of construction of public buildings at Fort Adams and Greble, R. I.	June 26, 1899
Bailey, Geo. G	Philippine Islands..... Chief quartermaster Department of the Visayas, Iloilo, Philippine Islands, as shown by last report.	Nov. 9, 1899
Bickham, Abraham S	Alexandria, Va.; in charge of construction of public buildings at Fort Washington, Md., and Fort Hunt, Va., under instructions of Quartermaster-General.	Mar. 28, 1900
Brown, Robt. L.	Sheridan, Wyo.; in charge of construction of public buildings at Fort Mackenzie, Wyo., under instructions of Quartermaster-General.	Nov. 6, 1900
Penrose, George H	Quartermaster and acting commissary of subsistence on U. S. transport Egbert.	May 24, 1901
Coulling, Wm. M	Quartermaster and acting commissary of subsistence on U. S. transport Thomas.	Sept. 15, 1900
Cannon, Wm. C	Quartermaster and acting commissary of subsistence on U. S. transport Sherman.	Mar. 14, 1900
Arnold, Danl. W	Quartermaster and acting commissary of subsistence on U. S. transport Kilpatrick.	Sept. 20, 1899
Colquhoun, Wm. C. R	Under orders for duty at general depot of the Quartermaster's Department, St. Louis, Mo.	
Baker, Chas. T	Quartermaster and acting commissary of subsistence on U. S. transport Sumner.	Feb. 13, 1900

Roster showing stations and duties of officers of the Quartermaster's Department, U. S. Army, July 1, 1901—Continued.

Name and grade.	Stations and duties.	Since—
• QUARTERMASTERS—continued.		
<i>With rank of Captain—Continued.</i>		
Scott, Wm. S	Ciego de Avila; quartermaster; in charge of Júcaro and San Fernando Railroad.	Mar. 24, 1900
Goodale, Geo. L	Astoria, Oreg.; in charge, under instructions of Quartermaster-General, of the construction of public buildings at Fort Stevens, Oreg., and Fort Columbia, Wash.	June 28, 1901
Barker, Walter B.	Cienfuegos, Cuba; depot quartermaster	Nov. 26, 1898
Baker, Jesse M	Quartermaster and acting commissary of subsistence on U. S. transport Grant.	Dec. 23, 1898
Rolfe, Robert H	Havana, Cuba; assistant to chief quartermaster, Department of Cuba.	May 20, 1901
Dare, Jeremiah Z	Washington, D. C.; on duty in Quartermaster-General's Office, in charge of miscellaneous war claims growing out of war with Spain, and also wagon transportation, purchase of cavalry and artillery horses, regular supplies, etc.	Aug. 15, 1898
Clayton, Bertram T	Manila, Philippine Islands; quartermaster	June 22, 1901
Batchelder, Nathan P	San Francisco, Cal.; assistant to depot quartermaster.	Apr. 27, 1899
Fredendall, Ira L	Philippine Islands	Dec. 9, 1900
	Depot quartermaster Zamboanga, Philippine Islands, as shown by last report.	
Pettus, Harry L	Quartermaster and acting commissary of subsistence on U. S. transport Hancock.	Dec. 28, 1900
Strong, Putnam B	Under orders to report to commanding general, Division of the Philippines, for assignment to duty.	
Cole, Frederick W	Manila, Philippine Islands, quartermaster	June 26, 1901
Butt, Archibald W	Philippine Islands	Apr. 30, 1900
	In charge of land transportation, Manila, Philippine Islands, as shown by last report.	
Grant, Frank A	Quartermaster and acting commissary of subsistence on U. S. transport McClellan, en route to Manila, Philippine Islands, reporting to commanding general, Division of the Philippines, for duty.	June 27, 1901
Chamberlin, Harry B	Quartermaster and acting commissary of subsistence on U. S. transport Indiana.	Mar. 1, 1900
Hunt, Clyde D. V	New Orleans, La.; disbursing quartermaster, etc., temporarily.	June 10, 1901
Creager, Noble H	En route to Manila, Philippine Islands, reporting to commanding general, Division of the Philippines, for duty.	
Garrard, Louis F., Jr.	Under orders to proceed to Manila, Philippine Islands, reporting to commanding general, Division of the Philippines, for duty.	
Davidson, Joseph T	Muscatine, Iowa; awaiting orders pending receipt of official bond.	
Barker, Alvin A	Newport, R. I.; awaiting orders pending receipt of official bond.	

NOTE.—The relative rank of the 6 officers last named not yet determined.

THE FOLLOWING OFFICERS HAVE BEEN DETAILED FOR DUTY IN THE QUARTERMASTER'S DEPARTMENT UNDER ACT APPROVED FEBRUARY 2, 1901, FOR A PERIOD OF FOUR (4) YEARS, VIZ:

Name and grade.	Stations and duties.	Since—
Turner, R. B Capt., U. S. Infantry.	Columbus Barracks, Ohio; in charge of construction of public buildings, under orders for duty at Des Moines, Iowa, to assume charge, under instructions of Quartermaster-General, of the construction of public buildings in connection with the military post to be established at that place.	Mar. 14, 1901
Baker, Chauncey B Capt., U. S. Infantry.	Havana, Cuba Chief quartermaster Department of Cuba; in charge of quartermaster's depot, etc.	Apr. 11, 1901
Lafitte, Jacques de L. Capt., U. S. Infantry.	Delaware City, Del.; in charge of construction of public buildings at Fort Du Pont, Del., under instructions of Quartermaster-General.	Mar. 9, 1901

AMOS S. KIMBALL,

Asst. Quartermaster-General, U. S. A., Acting Quartermaster-General.

QUARTERMASTER-GENERAL'S OFFICE, July 1, 1901.

WAR DEPARTMENT.
QUARTERMASTER-GENERAL'S OFFICE,
Washington, October 7, 1901.

GENERAL: I have the honor to report that during the fiscal year ended June 30, 1901, I have been on duty in this office in charge of the regular-supplies branch, and pertaining to the work of which branch I respectfully submit the following report:

REGULAR SUPPLIES.

This branch has charge of all matters relating to the procurement and distribution of supplies, stoves, and heating apparatus, and repair and maintenance of same, for heating barracks and quarters; of ranges, stoves, and apparatus for cooking; of fuel and lights for enlisted men, guards, hospitals, storehouses, and officers; of equipment of bakehouses to carry on post bakeries; of the necessary furniture, text-books, paper, and equipments for the post schools; of the tableware and mess furniture for kitchens and mess halls for enlisted men; of forage and bedding for the public animals of the Quartermaster's Department, and for the authorized number of officers' horses; of straw for soldiers' bedding; of stationery and blank books for the Quartermaster's Department, certificates for discharged soldiers, and blank forms for the Paymaster's and Quartermaster's departments; the purchase of cavalry and artillery horses, mules, wagons, ambulances, etc., and all matters pertaining to wagon transportation of the Army, and of all the necessary correspondence connected with the work of this branch.

This branch has charge, also, of matters relating to all contracts to which the Quartermaster's Department is a party.

CONTRACTS.

During fiscal year ended June 30, 1901, 1,869 contracts were received, examined, and filed in this office. Six hundred and seventy-

five were for 488,755,708 pounds of coal, 19,711 cords of wood, 43,633,819 pounds of oats, 55,908,984 pounds of hay, 6,753,011 pounds of straw, 2,763,260 pounds of bran, 1,771,000 pounds of barley, 1,220,573 pounds of corn, 7,460 bushels of charcoal, and 50,000 pounds of middlings; 9 for indefinite quantities of fuel, 10 for services, 29 for public animals, 66 for transportation, 227 for camp and garrison equipage, 194 for buildings, 29 for repair of buildings, 52 for plumbing, 2 for ambulances, 20 for roadways and walks, 39 for heating apparatus and system, 15 for sewerage, 48 for electric supplies, 44 for water and water supply, 21 for plastering, 2 for painting, 29 for telephone service, 151 for leases, 14 for repair of United States transports and steamers, 15 for hire of steamers, 6 for filling and grading, 10 for packing-boxes, casks, and tierces, 3 for drainage, 5 for mineral oil, 7 for aparejos and aparejo parts, 2 for hand litters, 5 for building material, 2 for demolishing buildings, 2 for books, 14 for wells, 14 for charter of steamers, 7 for wagons and wagon parts, 12 for harness, 1 for dump carts, 6 for paulins, 1 for subsoiling building site, 1 for gas, 1 for telegraph service, 7 for ranges, 1 for gasoline, 1 for lighters, 2 for wire fences, 1 for saw logs, 5 for lockers, 8 for repair of wharves, 1 for coal-handling apparatus, 1 for repair of wagons, 2 for repair of roads, 9 for flagstaffs, 3 for stone and brick walls, 4 for cots, 1 for lamps, 1 for bread ovens for portable stoves, 2 for wrecking outfit for raising vessels, 3 for constructing steam launches, 8 for tableware and kitchen utensils, 3 for flags, 1 for headstones, 1 for rubber hose, 11 for printing, 1 for water filter, 1 for crematory, and 1 for boilers for water tank and trestle.

PURCHASES AT GENERAL DEPOTS.

The following are the payments made by quartermasters for purchases for the Army at general depots, for use thereat and for shipment elsewhere, during the fiscal year ended June 30, 1901, from appropriations pertaining to that period:

Depot.	Regular supplies.	Incidental expenses.	Barracks and quarters.	Army transportation.	Total.
New York	\$913,737.38	\$82,645.37	\$73,387.32	\$272,740.21	\$1,342,510.28
Philadelphia	16,236.87	36,698.97	1,393.13	142,649.93	196,978.90
Washington	135,254.51	1,235.25	730.50	411,018.05	548,238.31
St. Louis	5,913.28	6,671.05	5,048.12	56,187.69	73,820.14
Jeffersonville	273,348.50	57,673.82	1,241.25	488,592.21	820,865.78
San Francisco	385,937.30	60,669.27	14,871.43	273,469.51	734,947.51
Total	1,730,427.84	245,598.73	96,671.75	1,644,657.60	3,717,350.92

Depot.	Typewriters.			Office safes.			Blodgett ovens.		
	Number.	Total.	Average.	Number.	Total.	Average.	Number.	Total.	Average.
New York	50	\$3,125.00	\$62.50	150	\$2,475.00	\$16.50	191	\$30,720.00	\$160.84
Manila, P. I.	20	1,640.00	82.00	.....	.....	.....	.....	.....	.....
Washington	2	164.00	82.00	.....	.....	.....	.....	.....	.....
St. Louis	1	82.00	82.00	.....	.....	.....	.....	.....	.....
Jeffersonville	10	625.00	62.50	.....	.....	.....	.....	.....	.....
San Francisco	118	8,781.50	74.42	5	1,075.00	215.00	8	474.70	168.28
Total	201	14,417.50	71.73	155	3,550.00	22.90	194	31,194.70	160.80

Depot.	Paulina.			Army ranges.			Field ranges.		
	Num-ber.	Total.	Aver-age.	Num-ber.	Total.	Aver-age.	Num-ber.	Total.	Aver-age.
New York	2,291	\$49,613.93	\$21.66	18	\$745.71	\$41.43			
Manila, P. I.									
Washington									
St. Louis									
Jeffersonville	1,140	17,304.00	15.18	778	42,828.75	55.05	2,301	\$79,130.00	\$34.39
San Francisco	666	18,814.50	28.25	34	4,515.70	132.81	510	18,814.00	36.89
Total	4,097	85,732.43	20.92	830	48,090.16	57.94	2,811	97,944.00	34.84

During the last fiscal year there have been shipped to the Philippine Islands (and China) for use of the army there:

Cavalry horses	4,881
Riding horses, for mounting infantry	4,337
Artillery horses	252
Draft horses	20
Riding horses, for pack trains	134
Bell mares	8
Draft mules	3,515
Pack mules	765

of which there were lost in transit 141 horses and 251 mules.

There were also shipped:

Escort wagons	689
Ambulances	73
Spring delivery wagons, covered	104
Dougherty spring wagons	31
Farm wagons	124
Six-ton drays	6
Dump carts	150
Hand carts	200
Water wagons	12
Surrey	1
Single sets wagon harness, lead	1,961
Single sets wagon harness, wheel	1,661
Single sets ambulance harness, lead	546
Single sets ambulance harness, wheel	406
Single sets spring-wagon harness	100
Single sets pony harness	225
Double sets pony harness	25
Single sets light-wagon harness	2
Sets cart harness	150

ST. ASAPH DEPOT, VA.

There were repaired and painted at the St. Asaph Depot, Va., during the fiscal year ended June 30, 1901:

Army wagons	300
Escort wagons	335
Ambulances	40

This transportation has been held for issue as required.

Sale of surplus and condemned animals.

	Number.	Total proceeds.	Average.
HORSES.			
Cavalry (condemned)	1,215	\$51,288.70	\$42.21
Artillery (condemned)	115	4,820.12	41.96
Riding (condemned)	3	66.99	22.33
Draft (condemned)	85	3,903.76	45.93
Surplus	4	389.82	97.46
Total	1,422	60,475.39	42.53
MULES.			
Condemned	414	19,018.53	45.94

Animals on hand.

	Horses.	Mules.	Oxen.
On hand July 1, 1900	15,519	10,786	2
Purchased since	10,617	1,736	
Received from officers	22,078	13,888	
Taken up astray, etc	27	107	
Total	48,241	26,516	2
Sold during fiscal year 1901	1,422	414	
Lost, died, strayed, stolen, and unaccounted for	1,681	1,790	
Transferred	22,448	13,518	
Total	25,551	15,722	
Total remaining on hand June 30, 1901	22,690	10,794	2

It is remarked that the number of animals on hand July 1, 1900, as shown in the annual report for the year ended June 30, 1900, differs considerably from the number reported on hand on the same date in the present report. In explanation it is stated that the reports received from the Philippines last year were very incomplete, as also were those from Cuba and Porto Rico, and it is believed that the number of animals reported on hand July 1, 1900, as shown in the present report, is almost correct, the consolidated reports of public animals received from the points mentioned being much more complete now than those received a year ago.

MEANS OF TRANSPORTATION.

The following statement shows the number and cost of public animals, wagons, and harness purchased from July 1, 1900, to June 30, 1901:

	Number.	Total cost.	Average cost each.
Cavalry horses	4,179	\$518,991.10	\$124.19
Artillery horses	316	44,839.87	141.90
Riding horses for mounting infantry	6,080	439,662.13	72.31
Draft horses	15	2,219.00	147.98
Pack horses	3	210.00	70.00
Bell horses	4	195.00	48.75
Ponies	20	1,280.00	64.00
Draft mules	906	104,170.42	114.98
Pack mules	830	68,371.33	82.37
Army wagons	2	348.00	174.00
Escort wagons	752	65,715.00	87.39
Farm wagons	26	1,717.50	66.06
Spring wagons, Dougherty	26	5,915.00	227.50
Wagonette, or other kinds	6	1,600.00	266.67
Ambulances, Red Cross	175	28,534.25	163.05
Trucks, 2 and 4 horse	10	3,543.00	354.30
Trucks, 1-horse	1	142.00	142.00
Dump carts	167	6,649.00	39.81
Dump carts, sanitary	8	1,490.00	186.25
Water wagons	23	5,775.51	251.11
Spring wagons, delivery	32	3,941.00	123.16
Miscellaneous wagons	8	991.00	123.87
Sleighs	4	281.00	70.25
Single sets harness	6,398	122,838.72	19.20
Aparejos and parts	1,417	46,309.62	32.68
Total		1,475,729.45	

Statement of public animals purchased, and their cost, in each department and depot during fiscal year 1901.

From what department, depot, or post.	Horses.					
	Cavalry and artillery.			Draft, pack, bell, and ponies.		
	Number.	Total cost.	Average cost.	Number.	Total cost.	Average cost.
Department:						
Lakes.....	668	\$65,141.90	\$127.46	2	\$400.00	\$200.00
Dakota.....	530	58,100.90	109.62			
Missouri.....	413	55,282.50	133.85	20	1,280.00	64.00
Colorado.....	328	37,974.30	115.77	2	300.00	150.00
Columbia.....				8	529.00	66.12
California.....	213	22,335.87	104.86			
Texas.....	1,061	129,925.00	122.45			
East.....	23	3,553.50	154.50	2	195.00	97.50
Depot:						
New York.....	35	7,000.00	200.00			
Washington.....	921	122,712.00	133.21	2	400.00	200.00
St. Louis.....	300	41,610.00	138.70	1	125.00	125.00
Jeffersonville.....				1	160.00	160.00
San Francisco.....				2	330.00	165.00
Seattle, Wash.....	3	195.00	65.00			
Fort Sheridan, Wyo.....				2	185.00	92.50
Total.....	4,195	563,830.97	125.43	42	3,904.00	92.95

From what department or depot.	Mules.					
	Pack.			Draft.		
	Number.	Total cost.	Average cost.	Number.	Total cost.	Average cost.
Department of the Columbia.....	480	\$45,435.00	\$94.66	100	\$14,276.00	\$142.76
Department of California.....	350	22,936.33	65.54	605	63,747.42	105.37
St. Louis depot.....				201	26,147.00	130.08
Total.....	830	68,371.33	82.37	906	104,170.42	114.98

RIDING HORSES INTENDED FOR MOUNTING INFANTRY IN PHILIPPINE ISLANDS, PURCHASED FROM APPROPRIATION FOR CAVALRY AND ARTILLERY HORSES.

	Number.	Total cost.	Average cost.
Chief quartermaster:			
Department of the Columbia.....	4,100	\$206,586.00	\$72.34
Department of California.....	1,980	143,076.13	72.26
Total.....	6,080	439,662.13	72.31

COAL FOR TRANSPORT VESSELS PURCHASED UNDER CONTRACT AND IN OPEN MARKET.

New York Harbor.—1,583,680 pounds Georges Creek Big Vein Cumberland coal, or equal, at \$2.50 per gross ton; 9,751,616 pounds same, at \$2.84 per gross ton; 20,362,880 pounds same, at \$2.85 per gross ton; 224,000 pounds same, at \$3 per gross ton; 56,999,749 pounds same, at \$3.05 per gross ton; 708 tons Pocahontas coal, at \$2.57 per gross ton, purchased at New Port News, Va.

Havana.—20,000 tons, approximately, Pennsylvania Victor coal, at \$5.35 per gross ton.

Santiago.—1,107 tons Victor coal, at \$6.80 per gross ton.

San Juan.—2,135 tons Pocahontas coal, at \$4.94 per gross ton.

San Francisco.—145,978,828 pounds bituminous coal, mostly Australian, at cost of \$597,086.54.

Portland.—10,630,547 pounds bituminous coal, at cost of \$27,129.86.
Seattle.—54,984,885 pounds bituminous coal, consisting of Roslyn, South Prairie, Comox, and other coals, at cost of \$90,747.62.

Foreign coaling stations en route to Manila via Suez.—(Cardiff coal, per ton of 2,240 pounds.)

Gibraltar.—1,240,960 pounds, at 35s. 6d. per gross ton ex-hulk and 39s. ex-lighter; 190,400 pounds, at 33s. 6d. ex-hulk and 37s. per ton ex-lighter.

Malta.—3,427,200 pounds, at 30s.; 224,000 pounds, at 29s.

Port Said.—851,200 pounds, at 37s. 9d.; 327,040 pounds, at 32s. 9d.

Aden.—465,920 pounds, at 48s. 6d.

Colombo.—3,380,160 pounds, at 49s.; 313,600 pounds, at 52s. 6d.

Singapore.—672,000 pounds, at 38s.; 282,240 pounds, at 46s.

Bermuda.—636,160 pounds, price not given.

Madeira.—280,000 pounds, price not given.

COAL PURCHASED, PHILIPPINES, NAGASAKI, HONGKONG, KOBE, MOJI, YOKOHAMA, AND SHANGHAI.

One hundred and forty-two thousand nine hundred and one tons Japanese and 120 tons Chinese coal, at cost of \$466,299.45; 87,361 tons Japanese and 3,836 tons Australian coal, at cost of \$709,584.47; 11 tons Australian coal, at cost of \$160; 66 tons Japanese coal, at cost of \$495; 713 tons Japanese coal, at cost of \$3,684.66; or a total of 235,008 tons, at cost of \$1,180,223.58.

RÉSUMÉ.

	Tons.
New York Harbor.....	40,405
Havana.....	20,000
Santiago.....	1,107
San Juan.....	2,135
San Francisco.....	65,169
Portland.....	4,746
Seattle.....	24,547
Foreign coaling stations en route to Manila via Suez.....	5,487
Purchased in Philippines, Nagasaki, Hongkong, Kobe, Moji, Yokohama, and Shanghai.....	235,008
Total.....	398,604

STATEMENT OF FUEL OTHER THAN FOR TRANSPORTS PURCHASED IN THE PHILIPPINES DURING THE FISCAL YEAR.

There were purchased during the fiscal year in the Philippines 15,868 cords of wood, mostly hard, at a total cost of \$60,176.14, the price per cord ranging from \$2.90 to \$4.04. This wood is reported to have proved very suitable for the purposes for which it was required.

Forage and straw purchased and shipped to Cuba, Porto Rico, the Philippine Islands, and China.

TO THE PHILIPPINE ISLANDS.

Shipped from—	Hay.	Oats.	Bran.	Straw.
San Francisco.....	5,656,804	7,678,848	301,201	.....
Seattle.....	36,996,012	28,889,423	.....	.....
Portland.....	17,465,546	15,407,017	53,790	.....
New York.....	13,611,907
Total.....	73,730,269	51,975,288	354,991

QUARTERMASTER-GENERAL.

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Forage and straw purchased and shipped to Cuba, Porto Rico, the Philippine Islands, and China—Continued.

TO CHINA.

Shipped from—	Hay.	Oats.	Bran.	Straw.
San Francisco.....	2,099,565	4,963,823	31,090	.....
Portland.....	661,322	309,938	.....	.....
Total.....	2,760,887	5,273,761	31,090

TO PORTO RICO.

New York.....	3,163,725	3,167,874	50,900	454,765
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FROM NEW YORK TO CUBA.

Shipped to—	Hay.	Oats.	Bran.	Straw.
Havana.....	6,849,453	6,975,041	232,250	1,031,028
Santiago.....	8,131,542	2,801,793	156,050	378,632
Matanzas.....	4,610,701	5,497,946	51,200	1,078,787
Cienfuegos.....	1,621,548	1,648,304	73,600	43,981
Mansanillo.....	1,746,644	2,375,050	70,850	47,931
Nuevitas.....	1,275,613	1,577,535	.....	100,957
Gibara.....	1,267,675	2,017,474	.....	185,440
Baracoa.....	96,130	78,300	.....	27,874
Yabuela de Sagua.....	3,516	2,000	400	.....
Cardenas.....	16,491	6,500	.....	.....
Ciego de Avila.....	.....	230,272	.....	.....
Total.....	20,619,308	23,210,115	584,350	2,892,630

RECAPITULATION.

Philippines.....	73,730,269	51,975,288	354,991	.....
China.....	2,760,887	5,273,761	31,090	.....
Porto Rico.....	3,163,725	3,167,874	50,900	454,765
Cuba.....	20,619,308	23,210,115	584,350	2,892,630
Grand total.....	100,274,189	83,627,038	1,021,331	3,347,395

Native forage purchased in the Philippines.

Grass (14,702,877 pounds).....	\$43,932.76
Palay (10,275,975 pounds).....	85,137.17
Rice (560 pounds).....	8.68
Tique tique (quantity not stated).....	439.70
Miel (quantity not stated).....	416.34
Corn (27,903 pounds).....	279.03
Total cost.....	130,213.68

Owing to the removal of troops from Cuba and Porto Rico, such quartermaster stores and supplies as were considered to be in excess of what were required were ordered returned to the United States for use elsewhere.

During the year 9,632 horses and 4,280 mules were shipped to the Philippines and China. Of the horses, 4,337 were for mounting infantry and were purchased at an average cost of \$72.31 each. While not conforming to the required specifications for the cavalry horses for the Army, these animals were acceptable and rendered efficient service. The greater portion of the mules were purchased during the

Spanish-American war for use in the West Indies, and after hostilities ceased were returned to the United States for shipment to the points designated.

All forage required by the public animals in Cuba and Porto Rico, with the exception of native grasses, has been purchased by the New York depot, and, until the discontinuance of the Government transports, was shipped to the various points where required by those vessels. Since the transport service to the West Indies was discontinued forage has been sent via commercial lines. Only half the regulation allowance of hay, in most cases, has been shipped, native grasses being substituted in lieu of the other half.

The forage required by the public animals in the Philippines has been purchased in Seattle, Wash., Portland, Oreg., and San Francisco, Cal., and has given general satisfaction. This forage has been shipped partly by Government transports and partly by commercial vessels specially chartered for that purpose, and, considering the extensive forage requirements (nearly 6,000 tons being required per month), has been furnished promptly and without delay. Since June, 1901 (by direction of the Secretary of War), only half the regulation allowance of hay has been shipped to the Philippines, the remainder being substituted by the use of native grass.

I am, General, very respectfully,

J. Z. DARE,

Captain and Quartermaster, U. S. A.

The ACTING QUARTERMASTER-GENERAL, U. S. A.

REPORT OF THE COMMISSARY-GENERAL.

R E P O R T

OF

THE COMMISSARY-GENERAL.

WAR DEPARTMENT,
OFFICE COMMISSARY-GENERAL,
Washington, D. C., October 18, 1901.

SIR: I have the honor to submit the following report of operations of the Subsistence Department for the fiscal year ending June 30, 1901:

RESOURCES, EXPENDITURES, AND BALANCES.

Statements exhibiting the resources, expenditures, and balances of the department for the fiscal year 1901, compiled from the office ledgers and such accounts of disbursing officers as had reached the office at the time the statements were prepared, are hereto appended, marked "Appendix I." Accounts from disbursing officers in the Philippines and Alaska closing up their accountability to June 30 can not reach this office in time to be included in the financial statement of the annual report. It is in contemplation to hereafter close the annual financial statement as of date April 30 for the purposes of the annual report, and thereafter, when the disbursing accounts for May and June shall all have been received, to transmit supplemental statements bringing down the accountability to the close of the fiscal year.

The following items of disbursement are included in the amounts reported as expended in the financial statement:

Nature of disbursement.	Appropriation.	
	Subsistence of the Army, 1900.	Subsistence of the Army, 1901.
Commutation of rations:		
To enlisted men on duty where rations could not be conveniently issued.	\$599.75	\$191,273.22
To ordnance sergeants at posts not garrisoned.	206.25	3,485.10
To enlisted men on furlough.	4,735.82	35,290.87
To enlisted men while traveling.	66.00	55,369.20
Special diet for enlisted men in Army and Navy Hospital, Hot Springs, Ark.	655.60	9,534.90
Meals for recruiting parties and recruits and troops moving.	4,188.69	178,960.71
Liquid coffee for troops traveling.	29.82	23,763.69
Advertising.	1,553.20	4,893.04
Printing.	136.34	992.90
Rent of telephones.		1,976.76
Commercial newspapers.		16.80
Ice for issue to troops and for refrigerating purposes (187,100,887 pounds).	1,407.10	110,390.90
Salaries of civil employees of Subsistence Department at posts and stations.		299,014.45
Salaries of civil employees of Subsistence Department on transports.		328,633.32
Board wages of civil employees of transports while ashore.		62,183.57
Extra-duty pay.	59.15	14,660.96
Wages of laborers and mechanics, fees of inspectors, and miscellaneous small employments.		117,957.77

HOSPITAL ISSUES.

The supplies purchased and issued from stock on hand during the fiscal year for enlisted men in hospital too sick to use the army ration, amounted in value to \$578,501.49.

Issues of articles differing from those of the ration to enlisted men in camp during periods of recovery from low conditions of health consequent upon service in unhealthy regions or in debilitating climates aggregated in value \$20,179.19.

Statement of the value of subsistence supplies issued to Philippine convicts and destitutes during the fiscal year 1901, and of the amount of same reported as collected from public civil funds of the Philippine Islands by Col. C. A. Woodruff, A. C. G., chief commissary, Division of the Philippines.

When issued.	Value.	Reported as collected on account of issues.	Amount.
Convicts:		Convicts:	
September, 1900	\$1,090.39	September, 1900	\$996.51
October, 1900	1,626.28	October, 1900	1,476.53
November, 1900	1,846.83	November, 1900	1,109.29
December, 1900	1,925.10	December, 1900	1,059.35
January, 1901	1,424.09	January, 1901	659.69
February, 1901	3,504.55	February, 1901	1,826.38
March, 1901	3,400.40	March, 1901	1,936.05
April, 1901	2,571.33	April, 1901	20.39
May, 1901	2,264.30	Unknown	1,697.34
June, 1901	1,600.82		
Destitutes:		Destitutes:	
May, 1901	200.00	May, 1901	200.00
Total	21,514.08	Balance due and to be collected	10,881.53
			10,632.55

Reimbursements from public civil funds of the Philippine Islands for issues to native scouts in February, 1901, amounting to \$656.92, were also made through Capt. M. S. Murray, commissary, in June, 1901.

Issues to Indians.

Apache Indians at Fort Sill, Okla.	\$11,935.13
Chiricahua Indians at Fort Grant, Ariz	65.58
Uinta Indians at Fort Du Chesne	4.48
Indians in Alaska	3,907.53
Seminole Negro Indians	13.59

Issues for civil employees and military prisoners.

	Rations.
Civil employees	1,948,039
Military prisoners at posts	415,218

Miscellaneous issues.

Civil prisoners deported to Guam and United States	\$69.50
Filipino insurgent prisoners deported to Guam	1,069.87
Chinese destitutes	19.61
Chinese prisoners of war	1,600.25
Spanish refugees	17.89
Cuban destitutes	150.04
Destitute citizens in the United States	7.65
Destitute citizens in Porto Rico	1.72
Destitute citizens in Alaska	221.22
Destitute citizens on transports	9.28
Alaska miners	108.47
Sufferers by storm in Texas in September, 1900	6,194.24
Insurgent Filipino prisoners captured and in arrest	211,080.00
Filipino destitutes	1,081.15

CUBAN SCHOOL TEACHERS.

The supplies issued for Cuban school-teachers were the subject of remark in annual report of previous year. The entire cost of their subsistence has now been refunded the United States, amounting to \$12,405.77.

SALES OF SUBSISTENCE STORES.

The amounts received from sales of subsistence stores during the fiscal year are classifiable as follows:

From whom or on what account received.	Subsistence of the Army.			
	January 1, 1899.	1899.	1900.	1901.
Officers.....	\$776.16	\$806.89	\$26,420.57	\$868,121.29
Enlisted men, companies, detachments, and hospitals.....		1,275.38	65,712.57	1,877,588.84
Civilians.....			188.80	186,493.37
Auction.....		2.09	487.05	31,755.33
Boxes, barrels, etc.....			5.00	2,778.08
Garden seeds, etc.....				105.00
Post exchanges.....		5.82	2,251.59	134,778.25
Quartermaster's Department.....				1,902.52
Indians.....				301.35
Indian agents and employees.....				3,302.63
Meals on transports.....			7,479.35	158,495.86
Naval officers and enlisted men.....			883.59	14,529.39
United States Boundary Commission.....				102.31
Post bakeries.....				123.54
Philippine natives.....				192.95
Nurse corps (female).....				262.31
Interior Department.....				95.95
Transport Pennsylvania.....				.48
United States Marine Corps.....				6,312.57
Weather Bureau observers.....				216.72
Court officials, Fort Egbert, Alaska.....				831.53
United States Geological Survey.....				19.19
Post hospitals.....				328.36
Engineer Department.....				610.21
Coast Survey party.....				340.17
Postmaster.....				143.05
Chaplain.....				207.51
Billfold prison, Manila.....				10.14
School-teacher, Iloilo.....				8.25
Postal employees.....				35.29
United States Land Office.....				179.47
Deported prisoners of war.....				62.78
Total.....	776.16	2,090.18	103,428.52	3,290,234.52

SALES ON CREDIT.

Sales on credit to officers of both the Regular and Volunteer Army in the fiscal year ending June 30, 1901, as shown by the accounts of that year thus far received, amount to \$29,345.16, and the sums thus far reported as collected through the Pay Department and otherwise settled amount to \$18,946.24, leaving the sum of \$10,398.92 yet to be collected.

The sales on credit to enlisted men of both the Regular and Volunteer Army amount to \$43,082.42; the collections by the Pay Department on muster and pay rolls and on final statements, on account of credit sales, amount to \$30,784.62, leaving still to be collected \$12,297.80.

Sales on credit to enlisted men of both the Regular and Volunteer Army during the previous fiscal year, not heretofore reported by reason of delay in receipt of accounts, amount to \$3,644.98, and the collections from same sources amount to \$4,415.61, leaving still to be collected on account of credit sales in that year \$4,113.53.

LOSSES OF STORES AND PROPERTY.

The value of the supplies lost by accident, by wastage in transportation, while in stores, etc., during the year, for which no one was held responsible, as shown by the returns for that year thus far examined, was \$93,312.07. Like losses which occurred during the preceding fiscal year, but which were not included in the annual report of that year, amounted to \$13,264.64. Of above sum of \$93,312.07, the losses by fire amounted to \$4,773.21; by flood and storm, \$1,940.64; by death of cattle, \$5,291.85; by theft, \$6,777.09; by capture, \$100.48; at sea, \$14,139.09; lost and thrown overboard, \$938.18; disappeared in China, \$392.43. In above sum of \$1,940.64, the value of the property lost by storm and flood at Galveston, Tex., September 8, 1900, \$285.17, is included.

Supplies lost during the year, the responsibility for which was fixed, amounted to \$20,715.47, of which \$9,226.28 has been reported as collected, leaving still to be collected \$11,489.19.

SALES OF CONDEMNED STORES AND PROPERTY.

From the returns thus far received and examined the stores condemned and sold in the fiscal year ended June 30, 1901, are shown to have been as follows:

	Subsistence stores condemned and sold.
Original cost of stores condemned	\$431,657.29
Amount realized from sales of such as were ordered sold	30,940.92
Loss	400,716.37

From sales of condemned property there was realized the sum of \$814.41.

The sum of the value of stores and property lost from inevitable causes and condemned, as above set forth, was \$494,842.85, which was about 3½ per cent of the appropriation for the fiscal year 1901.

Statement of the value of subsistence stores issued to marines, etc., and transferred in bulk to officers of the Marine Corps for issue to marines and of amounts collected on account of same.

Issued and transferred.	Value.	Collected.
Marines at San Juan, P. R.	\$4,140.56	\$3,814.71
Marines on transport Hancock	4,487.80	4,487.80
Marines on transport Grant	2,057.00	2,057.00
Marines on transport Sumner	77.00	77.00
Marines on transport Logan	68.00	68.00
Marines on transport Thomas	1,137.50	12.50
Marines on transport Rosecrans	104.50	104.50
Marines on transport Pak Ling	10.75	10.75
Marines on U. S. S. Nashville	17.78	17.78
Marines at Pekin, China	4,510.11	4,510.11
Marines at Tientsin, China	6,546.76	6,546.76
Marines at Cavite, P. I.	29,470.29	29,470.72
Marines at naval hospital, Philippine Islands	97.67	97.67
Marines at military prison, Philippine Islands	2,489.87	
Transferred to Lieut. William C. Harlee, Marine Corps	923.39	923.39
Transferred to Lieut. W. H. Clifford, Jr., Marine Corps	1,367.78	939.42
Transferred to Lieut. John G. Muir, Marine Corps	33,452.87	10,608.31
Transferred to Paymaster H. R. Sullivan, U. S. N.	4,243.16	4,243.16
Transferred to Rev. St. Paul Reynolds, U. S. N.	331.82	331.82
To deserter from Marine Corps	5.97	5.97
Paid for savings of enlisted men of Marine Corps	800.97	

Claims have been made on the Navy Department for such of the above sums as are due on account of supplies furnished and money expended for savings of marines.

Statement of other issues.

	Value.	Collected.
To Quartermaster's Department.....	\$1,816.78	\$1,895.64
To provost-marshal-general, Manila, P. I.....	1,545.11	1,545.11
To Postigo prison.....	142.92	142.95

CHINA RELIEF EXPEDITION.

In the preparations for the sending of a relief expedition into China in July, 1900, this office was furnished by the Adjutant-General with information gathered from various sources regarding the location and resources of the region which was to become the theater of operations in that country, and this information was duly furnished to the officers of the Subsistence Department who were to be directly engaged in the supervision and direction of the subsistence affairs of the expedition.

Maj. H. J. Gallagher, who had been designated as the chief commissary of the expedition, wrote to the Commissary-General from San Francisco as follows on July 16, 1900:

I wired you to-day requesting commissary, Manila, be directed to send cargo fresh meat to Taku without delay. This is the short cut to getting meat to where it is needed. If our forces do not exceed 12,000 this will supply them for a good period. By the time it is exhausted we should be able to procure from the country. If it is not all required at Taku it can be later on sent to Manila. The force I am taking, that is the three commissary sergeants and the clerks authorized in telegram, should be sufficient to conduct affairs systematically and efficiently. Regarding laborers I wish to say I believe it would be well to take 12 laborers from this country. I think they can be had for \$60 per month and their ration. If it is to be a war with the Chinese we can not get them as laborers if they were wanted. To call on the troops for details is the other alternative. It has two objections; it weakens the force of troops, and it furnishes indifferent labor. I would have no soldiers about the depot excepting a guard. If this meets your approval please telegraph and I will set about getting the men. The supplying of our troops there will be in the face of the whole world. There should be no hitch. I notice the press reports a scarcity of small craft to get men ashore; this means a scarcity for other purposes. This does not properly belong to the Subsistence Department, and may be none of my business, but in view of an experience that befell us before in this matter I think it is my duty to mention it.

It being found possible to provide the troops with fresh meat in the country, the refrigerator ship which was sent up from Manila with a cargo of meat was returned to that port in October following. In regard to other subsistence stores drawn from that source, Major Gallagher on October 29 reported as follows from Tientsin, China:

All my requisitions on Manila have been filled fairly well—as well, I am sure, as it was possible for them to be filled.

Capt. W. H. Bean, commissary, reported from Tongku on October 18 that—

it has been said that the Americans in China have fewer men and more supplies than any other nation here.

Major Gallagher also called attention to a matter which required rectification. Said he:

Packages containing subsistence supplies should be marked with the contents, instead of with pictures of proprietors, factories where made, gold, silver, and brass medals awarded.

A circular was subsequently issued from this office to all purchasing officers of the Subsistence Department, as follows:

Complaints have been received at this office to the effect that packages containing subsistence stores are not so marked as to show their contents, and that in many instances the various firms cover the boxes with advertisements, etc., and it is impossible to obtain any information concerning the contents. Purchasing commissaries will please take such steps as to insure the packages being so marked as to show the contents, the proper shipping marks, the names of the purchasing officer and contractor, and the date of purchase, and that all superfluous marks be omitted from the packages.

The following instructions were also issued to all subsistence officers on February 18, 1901:

In addition to the marks, designations, etc., heretofore placed on packages shipped by the Subsistence Department there will be stenciled on both ends of all packages, boxes, etc., hereafter the distinctive symbol of the Subsistence Department, viz: The crescent, of size 3 inches high and 2 inches wide, made of a contrasting color, and of pattern similar to design herewith.

In reply to a newspaper statement that on the march to Peking the Quartermaster's Department failed to furnish the necessary transportation, and the troops were loaded down with baggage in excess of their carrying capacity, Capt. Frank W. Ramsay, quartermaster, Ninth Infantry, and late acting chief quartermaster in the field and temporarily acting as chief commissary, China relief expedition, reported to the Adjutant-General of the Army as follows on December 27, 1900:

The men carried on their persons rifle, cartridge-belt with 100 rounds of ammunition, canteen, haversack with but one day's rations, tin cups, and a small roll across the shoulders. Owing to excessive heat many discarded this roll before the march was finished. In the advance on Peking pack trains immediately followed the troops with ammunition. The wagon train was always close enough to furnish an extra supply. Wagons carried the rations, which were issued every day; also engineer material, tools, and hospital stores. Coolies carried company cooking utensils and most of the officers' baggage, etc. Pack and cart trains, improvised with native animals, supplemented the whole, carrying forage and small rolls for officers who were not provided with coolies.

The supplies carried by the trains were often replenished from the fleet of junks, and the trains camped with the troops every night except one, when, through a misunderstanding, they went a mile or two beyond the camping place of the troops.

* * * Each organization was ordered to start with one day's rations in haversacks, four days' on wagons, and ten days' on the junks, a total of fifteen days' rations. These rations should have consisted of the staple components, i. e., bread, meat, coffee, sugar, salt and pepper, and some of the other components. At the camp just south of Hoshiwu I discovered for the first time that the hard-bread ration was incomplete. This was due to the fact that the Fourteenth Infantry brought only 5,000 rations of hard bread on the junks instead of 10,000 rations of this component, which should have completed the staple ration. I reported the facts to the commanding general. To insure uniformity I was directed to combine all rations. From that time, August 8 to August 19, the issue to the whole command of that one component was reduced, at first to 80 per cent and afterwards, for a few days, to 70 per cent.

There was no material reduction in the other staple components of the ration at any time, and, while it was not always possible to issue one kind of meat, bacon, corned beef, and a small percentage of salmon made up the total of this component.

Within my experience troops have always been required to carry heavier packs than on the way to Peking, and on account of the fertility of the soil they never lived better while on active campaign in a hostile country.

The only complaint regarding rations came to me as follows: About September 2 General Chaffee directed me to investigate a complaint made by Colonel Daggett that his troops were receiving not more than 80 per cent of any component of the ration. I met Colonel Daggett a few moments later. He referred me to Captain Martin, of his regiment, as the authority for the report. I immediately made personal investigation and inquiries of the depot commissary, Lieutenant Munson, and the acting commissary, Fourteenth Infantry, Captain Reynolds, but failed to find any foundation for the complaint. I visited Captain Martin, who called up his com-

pany quartermaster-sergeant, upon whose statement, he said, he had based his complaint. This sergeant admitted that he could have drawn the full staple ration at any time after August 19, but complained of the lack of fresh onions and potatoes. As a matter of fact, some of the vegetable ration was carried and issued en route, the country, however, furnished such a bountiful supply of vegetables, eggplant, green corn, sweet potatoes, beans, lettuce, etc., that the vegetables brought on the trains were transferred to the junks and extra staple components taken in their place.

Capt. William Crozier, Ordnance Department, in his observations on the Pekin relief expedition, published in the *North American Review* for February, 1901, said:

To begin with the Subsistence Department, it is borne in upon the campaigner that the eatables and drinkables, if not the most important, are at least the most continuously insistent of the indispensables. Of these there was an ample supply at Tientsin from the time of the arrival there of the first American troops, and they included not only the ordinary components of the ration, but most of the delicacies classed as fancy groceries. Ginger ale and bottled waters were in abundance and plenty was the order of the day. The food of our soldiers exceeded in quantity, quality, and variety that of any of the allied forces, as was the comment of all foreign officers under whose notice it fell. When the march to Pekin was taken up, however, the fare was less generous. All supplies directly accompanying the troops had to be carried in wagons or on pack mules, and of these means of transportation the command was very short, having sufficient only for carrying three days' rations and 100 rounds of reserve ammunition per man; but, in common with the other contingents, we had a reserve supply of rations and ammunition following upon junks by the Peiho, of which the course was in the general direction of the march as far as Tung Chow, within 13 miles of Pekin. Such luxuries as tents, however, were out of the question, officers and men sleeping in the open air and taking the rain as it came.

The ration thus carried was reduced to about 3 pounds per man, the full ration in bulk with its packing cases weighing about 5 pounds per man, and comprised the staples: Bacon, hard bread, sugar, coffee, rice, beans, and condiments. Even so, it was better than was carried for the troops of any other nation. The Japanese had only rice and dried fish, the Indian troops mainly rice, the others a variety and quantity approaching but not equaling those of the Americans.

* * * I have neither heard nor read any criticism of the operations of the Subsistence Department other than as these were affected by lack of transportation, which suggests inquiry as to the character and quantity of the latter. * * *

Within three days after the arrival at Pekin fancy groceries and bottled waters began to make their appearance in the American commissary, and within a week there was abundance of these for all.

The following extracts from a report made in pursuance of A. R. 56, by Capt. Thomas Franklin, A. C. S., U. S. V., dated at Manila, January 30, 1901, give the results of his observations in China:

As there is no doubt in my mind that the American soldier was the best fighting man of all the allies, I shall only draw comparisons from which we can benefit, I believe, between his needs and supplies and those of his quondam friends.

In the first place he required more and better food than they, and he got it. This fact astonished the European troops above all else. A British officer said to me: "How often do you give your men this excellent bacon?" "Twenty-one times a week, if they want it," said I, and he did not believe me. But while our food and other supplies were infinitely more generous in quantity and quality than that of the others, it was not packed with the same scrupulous care for safe carriage and quick handling. In this particular the Japanese and British were without rivals. * * * As a rule our subsistence stores were very well packed in strong cases of moderate weight and volume. Sacks were all double-sacked and were quite strong. * * *

Reverting once more to the food question, in my mind there were none who had as excellent or abundant a supply as the Americans. The Japs had rice, bread, and dried fish, and tea, which they supplemented by the use of the sheep and cattle the country produced. They also had American canned meats, but they were not used with impunity—seemed to be more of the nature of a special or emergency article of their diet.

The British white troops had a ration similar to ours in quality and quantity, but not so varied or flexible. They used tea instead of coffee. The British Indian troops had about three-fourths pound atta or flour, about 1 pound rice, 1 gill ghee or vegetable oil, salt, and once a week a pound of fresh meat, bone and all.

The Sikhs only used mutton or goat, but the Mohammedans ate everything except pork.

The Russians had little besides a black bread and soup. They were given one-fourth pound cans of some kind of meat preparation at intervals, much in the same manner as the Japs used American meats. They had the finest cooking arrangement, though, of any. Upon a springless carriage was mounted an iron furnace under a semispherical boiler, water-jacketed. The boiler was fitted with a tight-fitting cover, and the whole was very strongly and compactly built. Into this they put all the materials for a soup or stew that they possessed, and nothing came amiss, screwed down the cover, lit the fire, and away went this perambulating soup tureen with its company. When they made camp, all they had to do was "stack arms" and then march past the soup machine, the cook opening a faucet, and each man received his ration of hot, well-cooked, thick soup. The assistant cook in the meantime, was chopping up a loaf of black bread with an ax, and each man got a liberal chunk. I tasted this bread several times, and it did not improve upon acquaintance. It seemed to have been made of equal parts of bran, sand, sawdust, and was sour besides. This was an ideal and an economical way to prepare soldiers' food; but I am afraid soup, three times a day, is too much of a steady diet for the American to adopt. The Russians thrived on this, for they looked hearty and strong. * * *

Altogether, the American force was better fed, both in quantity and quality of the ration, better clothed, and for the winter especially so, and had the best transportation, newspaper correspondents to the contrary notwithstanding.

Capt. James H. Reeves, Fourteenth Cavalry, military attaché to the United States legation at Pekin, China, in his report to the Adjutant-General of June 7, 1901, says:

Of the ration and sales stores furnished by the Commissary Department, there is nothing but praise heard from all sides.

In certain shipments of stores, a few staple articles sometimes ran short, due to carelessness on somebody's part, and this caused some little complaining. For several weeks no lard could be obtained from the commissary, and as none could be purchased in the city, some inconvenience resulted. On one or two occasions flour ran out for a short time, and shortages of other minor articles were noticed; but generally speaking, the quantity, quality, and variety of articles furnished attracted the envious attention of all European armies. So far as it has been possible to learn, the commissary of no other nation attempted to furnish more than the components of the ration, and, in the case of the French, this appeared to consist largely of cheap wine. The proximity of the home base of the Japanese army permitted its being plentifully supplied; and from the amount of supplies sent over it would not appear that the Japanese soldier's wants are appreciably less than those of other nations.

On March 28, 1901, Maj. H. J. Gallagher, chief commissary of the China relief expedition, made a report, in compliance with the request of this office, upon the subsistence furnished to the troops of the allied forces by their respective Governments. His report upon this subject is printed as Appendix V of this annual report.

On August 16, 1901, he submitted a report upon the operations of the Subsistence Department in the China relief expedition, as follows:

SAN FRANCISCO, CAL., August 16, 1901.

COMMISSARY-GENERAL OF SUBSISTENCE, U. S. A.,
Washington, D. C.

SIR: I have the honor to submit the following report of the operations of the Commissary Department in connection with the China relief expedition:

On arriving at Tongku, China, August 21, 1900, it was found that the allied forces had entered Pekin and relieved the besieged legations. About one-half of the United States forces were at Pekin, the other one-half at Tientsin, excepting a small detachment at Tongku. The number of troops present at this time, including marines, approximated 5,000.

Rations and sales stores had been unloaded at Tongku, where they were piled in considerable confusion. A reliable commissary-sergeant and competent assistants were at once placed there. Later, upon application, Lieut. W. S. McNair, of the artillery, was detailed to assist me.

He was sent to Tongku. Under his management, and later that of Captain Bean, system and better care of stores prevailed.

Sending forward stores from Tongku to Tientsin, thence to Peking, occupied attention until the beginning of November, when all supplies necessary to maintain the force there for six months, under any possible emergency, had been sent forward, and the troops remaining at Tientsin had also been provided for.

About this time I was ordered to Peking, arriving there November 17. Thereafter there was little to be done outside the ordinary routine of post commissary duty.

The supplying of fresh meat during the early stages of the trouble was done from a refrigerating ship in the harbor off Tongku; later, when confidence was restored, the Chinese brought in for sale beef cattle and sheep of first-rate quality. During the active work of the campaign the troops were on one or two occasions short portions of the ration, due to lack of transportation, but at all other times during their stay in China they had the ration complete and of as good quality as could be had at home. Fresh bread was supplied at Peking from excellent brick ovens that were constructed under the direction of Capt. F. DeWitt Ramsay, of the Ninth Infantry, whose work while acting as chief commissary before my arrival merited and received high praise from officers serving with him. Sales stores were plentiful in quantity and variety. The enlisted men and members of the American legation were permitted to purchase freely. Beef cattle and sheep were slaughtered daily.

The number of troops was gradually diminished, about 2,000 being left to winter in China.

The following facts regarding the resources and climate of the Tongku-Tientsin-Peking district of China should be noted, as they would prove useful in case of future expeditions:

RESOURCES FOR SUBSISTENCE.

Under normal conditions, beef, mutton, tea, rice, sugar, black beans (Chinese variety), candles, pepper, salt, potatoes, corn meal, chickens, and eggs can be purchased at Peking and Tientsin. At Tientsin also can be purchased quite a number of the articles on the sales list, viz, tobacco, cigars, toilet soaps, towels, aerated waters, and sauces. Fresh fruit is quite abundant. (The cost of the above-named articles is in some cases more, in other cases less, than in the United States. The average would be about the same.)

In time of trouble troops should have with them rations and necessary sales articles to last until quiet is restored or until a new supply could be provided. No difficulty was found in procuring coolie labor; it is cheap and excellent.

The following articles of the ration can not be obtained in this part of China to good advantage: Flour, bacon, coffee, and soap. A good quality of wheat is grown, but the milling is primitive. Corn and millet are plentiful, and corn meal is much used as an article of food by the Chinese coolie classes. Water is obtained from wells, rivers, and canals, and is quite plentiful. The well water is not bad. The river and canal water is bad for man, but our animals suffered no evil effects from it. Our officers depended upon aerated waters furnished by the Subsistence Department, most of which, of very good quality, was procured from Japan.

On my return to the United States from Manila I paid a visit to Hongkong, Macao, and Shanghai, China; Nagasaki and Kyoto, Japan, and at each place made inquiries that I thought might be useful to the Subsistence Department.

Hongkong has no local supply of fresh meat, beef cattle and mutton being shipped in from the north. The supply of other articles does not exceed the ordinary demand, excepting those articles that the country produces, such as rice, tea, and beans. There are several large American and English firms that could supply with sufficient notice anything an army might require.

Shanghai is a large commercial center, but here the supply of such articles as flour, bacon, and coffee depends upon the demand, and an unusual demand would send prices up and clear the market. There are enterprising firms with great resources in ships and money. There is a small local supply of beef cattle, but most of the supply in both beef and mutton is drawn from the north, and, if time is given, the Chinese dealers can procure plenty of both. From my experience I should say that it would not be safe for an army to land anywhere in China without a two-months' supply of breadstuffs, coffee, cured meat, and a one-month's supply of tinned meat, sugar, beans, and other articles of the ration.

CLIMATE.

Freezing weather begins about November 1 and ends about March 15. The coldest day in Peking last winter was 2° F.; the average temperature about 20° F. during the period mentioned. There is no rain from October 1 until May 1. The summer is

about of the same temperature as that of the Middle States. During the months of March and April winds prevail, and the accumulated dust of winter flies in clouds. All in all the climatic conditions are most favorable, and, excepting during the dust-storms, out-of-door life is enjoyable. The Peiho River freezes over about November 15 and remains frozen over until about March 15. This is not a matter of so much importance, now that a railroad is in operation from Tongku to Pekin, as it was before the advent of the railroad and all freighting was done by boat.

TRANSPORTATION.

When the allies reached China the railroad had been destroyed by the revolutionists, and recourse to river transportation was necessary. From Tongku to Tientsin boats drawing 7 feet could pass.

At Tientsin all freight had to be transferred to boats drawing not more than 2½ feet. It usually took a steam tug and lighter to make the 38 miles from Tongku to Tientsin about twelve hours. The distance from Tientsin to Tungchow is about 95 miles and usually took 5 days, the boats being hauled by coolies who walked along the bank, the rope being fastened to the top of the mast. At nighttime the boats were usually tied up.

From Tungchow to Pekin is 13 miles, over a rather rough wagon road. An escort wagon could make the trip in four hours. The country from Tongku to Pekin is level; no obstruction to travel would be encountered, excepting canals, which are quite numerous. A detachment of engineers with small pontoon outfit should go with troops. Average width of canals about 50 feet.

I wish to mention the names of the following officers, enlisted men, and civilian employees, who rendered excellent and faithful service in the Subsistence Department: Capt. W. H. Bean, whose presence at Tongku, though of short duration, was of great assistance to me; Lieut. W. S. McNair, of the Artillery, who is a most capable officer in any position; commissary sergt. Stephen F. Burgoyne; civilian clerk Philip P. Paschel.

I regret that upon the breaking up of the China relief expedition a surplus of both sales stores and rations was found to exist. In explanation I would like to state that this was due to lack of reliable knowledge as to the resources of China, and uncertainty, to the very last, as to the number of troops to winter in China; a necessity to provide against any possible emergency, as prolonged field service or possible siege, and to the fact that a shipload of subsistence stores was discharged at Tongku without a scrap of paper being left, as far as I know, showing the quantity and kind of stores put ashore. These stores were intended for Manila, but were unloaded at Tongku without good and sufficient reason. It was impossible for a long time to ascertain by accurate inventory the quantity of various articles in China, they being at Pekin, Tungchow, Tientsin, and Tongku, and on the Peiho River in junks en route to these various places.

JAPAN.

I spent ten days in Japar, and from all inquiries made I judge Japan is practically barren of supplies fit for European or American troops, excepting for rice and tea. The supply of native fresh meat is very small, also breadstuffs. The resources are much more limited than those of China.

HUGH J. GALLAGHER,
Captain, Commissary.

Concerning the confusion at Tongku and Tientsin which occurred in the receipt, storage, issue of and accountability for the subsistence stores sent in bulk to those places as distribution points for the troops operating in the relief expedition, Major Gallagher, in a certificate submitted to a board of survey convened at Pekin on December 20, 1900, to "investigate discrepancies found to exist between subsistence stores invoiced and received, and to examine into, report upon, and fix the responsibility for the loss and deterioration of certain subsistence stores" for which he was responsible, says as follows:

I arrived in China August 21, 1900, and upon landing at Tongku found quantities of subsistence stores on the wharves. These stores were parts of several shipments which had been hastily unloaded and mixed together in great confusion. Many of the cases were in bad condition. I proceeded to Tientsin the same day, and found the stores at that point in like condition. Storage room was insufficient, and stores

were stacked on the river front or stowed on lighters in the stream. First Lieut. F. M. Savage, Fourteenth Infantry, was in temporary charge of the depot, but had not assumed responsibility for the property. Shipments had been made to the troops advancing to the interior, but had not been invoiced, lists of the amounts forwarded being the only record kept.

At this time the main body of the command was at Pekin, with detachments posted at various points between that place and Tientsin. I found that the troops at the front were insufficiently supplied with rations, and that any attempt at verification or formal transfer at that time would cause serious delay and further deprivation. Under these circumstances I assumed responsibility, and immediately began forwarding stores, nine junkloads leaving the day after my arrival, and from that time on the troops were kept fully supplied.

Only one subcommissary, that at Pekin, had been established up to this time, and it was necessary to supply the detachments along the river and en route from Tongku to Matao (a distance of 120 miles) direct from the Tientsin depot. Shipments were made by junks and lighters. In many instances the stores were reported short upon arrival at destination, or that some of the perishable components, such as dried fruit, potatoes, onions, etc., had been lost by deterioration. In all such cases the loss was promptly made good, although the evidence necessary to cover such loss was not always supplied, nor under the circumstances was it practicable that it could be. The troops had passed through a severe campaign, and it was imperative that the full ration should be issued them.

Action was taken to prevent loss in transit. Guards were placed on each boat and lists of contents furnished those in charge, for which they were held responsible. Under this system losses, which at the start formed a large percentage of the total shipment, were reduced to the minimum by the middle of September.

The work of straightening the accounts and property was commenced when I assumed charge, but was necessarily made secondary to the problem of supplying the troops. On August 22 a commissary-sergeant and civilian employee were detached to take charge of and secure the stores at Tongku. Those at Tientsin were housed as rapidly as space would permit. All stores, whether covered by invoice or not, were taken up and accounted for.

Upon final balance of my papers I find the following discrepancies, viz: Excess [valued at \$20,988.46], all of which has been accounted for to the Government; and shortage [valued at \$9,139.43].

In view of the above it is evident that, while there were losses in transportation and by deterioration, the discrepancies are mainly due to errors in invoices and shipments which, owing to the manner in which the stores were received, it is now impossible to trace or determine; and further, that such errors were unavoidable, and incident to the supply of troops in active campaign.

Attention is invited to the fact that the money value of the excess is \$20,988.46, while that of the shortage amounts to \$9,139.43. Items such as a shortage of 18,000 pounds of coffee can not be attributable to any other cause than mistake in shipment. In a similar way must the excess of 8,015 pounds of maccaroni be attributed to a like error. Other parallel cases will be easily noted. These facts lead to the inevitable belief that in the haste attendant upon the earlier movement of troops from Manila to Taku, mistakes occurred that it is simply impossible to rectify now.

Lieut. F. M. Savage, Fourteenth Infantry, certified as to the shortages of subsistence stores in depot at Tientsin, as follows:

A great many boxes of stores, both sales and issue, have arrived at the storerooms with from two or three packages to two-thirds of the whole contents gone. It has been impossible to check off any one invoice. The stores shipped on different vessels were invoiced separately, but as they were unloaded from different vessels at the same time it was impossible to tell which vessel any stores came from. All stores coming in were checked, but it is impossible to say which vessel the stores short were lost from. I was present during part of the time the stores were loaded on the *Indiana* and *Flintshire* at Manila, and saw the reckless way the stores were handled. This was due to the fact that they were handled by soldiers who were not experienced hands at such work, and very often boxes would fall from the slings and be broken open. Before arriving at the storehouse here all the stores were handled from four to eight times, and a great deal of the shortage naturally occurred from this. Owing to the small amount of transportation here, stores had to be left at the railroad depot here for several days. There was not enough help in the country to leave a man with stores when they were left. A guard was kept, but I am quite sure that stores in small quantities were taken from them. All the care possible was taken of stores received, and no stores lost after being received at the depot.

The board of survey, from all the evidence submitted to it and obtainable, made the following finding and recommendation, which were approved by Maj. Gen. Adna R. Chaffee, U. S. V., commanding the China relief expedition:

The board finds that on the arrival of Maj. H. J. Gallagher, commissary of subsistence, U. S. V., in China, August 21, 1900, large quantities of subsistence stores mixed together in great confusion were scattered on the wharves at Tongku and Tientsin and at the depot at Tientsin; that this was due to a lack of transportation necessary in unloading, storing, and forwarding the shipments of stores being received in China, and further due to the urgent demand for shipment of needed rations and stores to Pekin, Matao, and other intermediate points where troops were stationed; that these shipments were so urgent that it was not possible to stop and check up the stores; that in the necessary hurry many mistakes in invoices were made, and in many cases stores had been lost through unskillful handling by men not familiar with the loading of stores on transports; that in all outlying detachments to which it was necessary to ship stores promptly to avoid suffering, there was but one subcommissary (that at Pekin), and it was frequently impossible to invoice the stores; that in many cases, owing to a similarity of packages containing different stores, articles were shipped that were not invoiced and others invoiced that were not shipped; that a quantity of perishable stores, such as potatoes, spoiled during transportation; that it was impracticable to have them acted upon by boards, and that when possible they were replaced, and that the amounts of such stores can not be fixed; that through the energy of Major Gallagher and his subordinates the command was kept supplied with rations, and that the conditions causing the loss of stores enumerated below were the natural result of the haste and confusion attending the rapid advance of the troops and the necessity of keeping them supplied. The board finds that Maj. H. J. Gallagher, commissary of subsistence, U. S. V., has taken up on his papers subsistence stores to the value of \$20,988.46 more than has been invoiced to him, and that there has been a loss and now exists a shortage of subsistence stores, for which Major Gallagher is responsible, amounting in value to \$9,139.43.

On receipt of the proceedings of the board at this office they were returned to the Adjutant-General with the following indorsement, dated February 18, 1901:

Respectfully returned to the Adjutant-General of the Army, with recommendation that before these papers are submitted to the Secretary of War they be referred to the officers of the supply departments in Manila for remark. Attention is invited to the condition of affairs, as pointed out in the certificate and affidavits herewith, particularly in that of Lieut. F. M. Savage, Fourteenth Infantry, U. S. A.

The question is asked, to whom these stores were invoiced when they left Manila? It would appear that they should have been invoiced to Lieutenant Savage, although, from the statement of Major Gallagher, Lieutenant Savage was only in temporary charge and had not assumed responsibility for the property.

After two and a half years' experience we ought to be able to put stores aboard a ship now and come closer than this to getting them to the party to whom they are invoiced.

The reports from the officers of the supply departments in Manila showed that the Ninth Infantry left Manila in June, 1900, with thirty days' rations and a liberal supply of sales stores, invoiced partly to the commissary of the Ninth Infantry and partly to the commissary of the transport *Logan*; that General Orders, No. 49, Headquarters Division of the Philippines, 1900, directed the shipment of 450,000 rations and sales stores, and practically directed the establishment of a subsistence supply depot in China, with the commissary officer of the Fourteenth Infantry in charge; that these stores were shipped with the troops July 13 to 21, part of them invoiced to Lieutenant Savage and part to the depot commissary at Taku, China, which place they probably reached the latter part of July; that it would seem that for three weeks no one became responsible for them, though the headquarters at Manila had designated an officer for the purpose, and the stores were invoiced to him partly by name and partly by his official designation;

that the stores were handled from four to eight times, the landing at Taku being most difficult, and were scattered from Taku to Pekin with no one in charge before Major Gallagher commenced to take stock; that the stores were in charge of Lieutenant Savage when handled in loading; that the vessels were necessarily prepared for departure with the utmost dispatch, and as a consequence stores had to be handled with a much less degree of care than under ordinary circumstances; that rough weather prevailed at the time of loading; and that there was a scarcity of European and American help of all classes, caused by many employees leaving their positions in order to go to China, necessitating the employment of a large number of Filipino stevedores who were inexperienced in handling stores on board ship.

The original proceedings of the board of survey, accompanied by these reports, were submitted by this office to the Secretary of War on July 19, 1901, and by him approved on August 28, 1901.

COST OF THE RELIEF EXPEDITION TO CHINA.

The expenditures of the Subsistence Department in connection with the relief expedition to China were as follows:

By the chief commissary United States forces in China.....	\$56,000.00
By the chief commissary Division of the Philippines, Manila	310,585.54
By commissaries in the United States.....	307,562.28
Total.....	674,147.82

DIVISION OF THE PHILIPPINES.

The operations of the Subsistence Department in the Philippines are shown by the subjoined reports from the chief commissary of the division, the chief commissaries of the departments of Northern and Southern Luzon and the department of Mindanao and Jolo, and the depot commissaries at Manila.

HEADQUARTERS DIVISION OF THE PHILIPPINES, OFFICE OF CHIEF COMMISSARY, Manila, P. I., August 15, 1901.

The COMMISSARY-GENERAL UNITED STATES ARMY,
Washington, D. C.

SIR: In compliance with the directions in your circular letter of February 19, 1901, I have the honor to submit the following report of the operations of the Subsistence Department in this division during the fiscal year ending June 30, 1901.

During the first three months of the period covered by this report stores here had, for various causes, become greatly reduced, but owing to the grand response made by the Commissary-General to every call from this office and the energetic action of the purchasing commissaries in San Francisco and New York, this was speedily corrected, and this division was soon supplied as no other army of its size has ever been supplied in the world's history.

During the period covered by this report the command to be supplied extended from the Great Wall of China on the north to the island of Borneo on the south and the island of Guam on the east. There were 480 stations in this archipelago, besides the troops in China and the prisoners in Guam.

In addition to the 68,000 troops and 3,000 officers in this division, the Subsistence Department supplied the delicacies for the sick, rations for 4,000 prisoners of war, 1,800 marines, many of the stores for the navy, rations for 1,000 civilian employees, and sales stores for the army, navy, and marine officers, Philippine Commission and attachés, and Americans employed by the army and by the Government in its treasury, post-office, interior, and educational departments, metropolitan police, native police and scouts, transports, etc. In other words, nearly 100,000 persons, occupying a country almost destitute of meat and vegetables, and other food supplies suitable for Americans, were supplied largely from a single base, 7,000 miles distant.

After the stores reached Manila they had to be landed in *cascos* and then distributed by steam vessels, one short railroad, by *cascos* and *bancos* poled up narrow rivers, by wagon and carabao carts along almost bottomless roads, by pack mules and coolies over mountain trails, often through a hostile country, and some of the posts supplied were more distant, in point of time, from Manila than is the capital of our country.

Reports of army officers in China were, without exception, most favorable to the excellent service of the Subsistence Department.

An English writer, comparing the troops of the allied armies, said: "The American commissary is undoubtedly far the best of all, and the American soldiers are best fed, both in peace time and in the field."

To the colonel of each returning volunteer regiment a letter in substance like the following was addressed:

"COLONEL: As you have had an extended experience prior to coming here, and in the Philippine Islands, I have the honor to request that you will please report upon the quality and the sufficiency of the food (rations and sales stores) furnished the troops under your command while serving in the Philippine Islands.

"Any suggestions that will be of assistance to the future work of the Subsistence Department will be appreciated."

Replies have already been received from nearly all of them, and indicate that the efficiency of the department in China was duplicated here. An extract from one of these, who was a volunteer enlisted man in the civil war, states:

"I started from San Francisco June 27, 1898, and the temperature of the place where the enlisted men ate was such that from that day to this I have taken credit for service at mealtime in the Torrid Zone. The Commissary Department from that time to this, in supplying both rations and sales stores, has surpassed the wildest dream of the soldier of the civil war. As to variety and quality of ration elements and sales stores, I think the tendency is on the side of overdoing. I say this after watching for three years carefully and constantly. The Department deserves only thanks."

The sale of subsistence stores to parties not authorized by regulations is constantly increasing, and placed a burden upon the Department that is hard to control. Everyone with a vestige of a claim is pressing for the privilege of purchase, and at times this office has suspected that the privilege was abused, but owing to the very nature of the business it is hard to keep accurate trace of, as Americans object to espionage of their households.

In theory the sale is to enable employees to live upon their salaries, the price of subsistence stores being from one-half to one-third the market rates, but sales are made to many whose salaries are based upon extra cost of living here. The revenues of the insular government are decreased and the merchants deprived of legitimate business.

The sales store in Manila has been efficiently conducted by Capt. F. H. Lawton. The total cost of labor for handling, accounting, selling, and delivering has been 4.9 per cent of the sales, the average monthly amount of which, notwithstanding the restrictions, has been \$40,000, and the stores sold embrace nearly every article of food found in a first-class grocery store—spices, sauces, etc.; cigars, tobacco, and pipes; toilet soaps and laundry materials; tailors' materials, stationery, mineral waters, toilet articles, and sundries—and these articles are furnished to posts all over the archipelago. Many articles are supplied that have never been furnished to military posts in the United States.

The quantities and varieties furnished were needed, because officers and enlisted men are almost wholly dependent upon the Subsistence Department, and climatic influences cause a capriciousness of appetite unknown in the United States. There is an alternate longing for sweets and acids, necessitating the supply of a great quantity of candy, jams, preserves, pickles, and sauerkraut.

The chief commissary, Department of Northern Luzon, supplying 27,000 troops, said: "The sick report since July, 1900, has been reduced about 50 per cent, and is due largely to the unhesitating subordination of the Subsistence Department to the health and comfort of the troops, sparing nothing that would promote an efficient condition of supply."

The fresh-meat supply has become one of the most difficult problems with which the Subsistence Department has had to contend. There has been a widespread epidemic of rinderpest, so depleting the stock of native cattle that in many places it was impossible to purchase beef, and in most cases the loss was great where the cattle were shipped in from the outside. As far as possible the use of frozen beef has been extended, no expense being spared to get it to the troops in good condition. Ice boxes are placed upon coast steamers. In places it is taken from refrigerator cars and shipped by carabao carts 60 miles into the interior, and in others 20 miles by

pack mules. This beef is brought from Australia by naval supply vessels and is of excellent quality. The Department uses about 15 tons per day, and this furnishes seven-tenths fresh meat for 34,000 men. An improvement of water transportation that would give the Subsistence Department control of three vessels of 600 or 800 tons, with about 75 or 100 tons refrigerating and cold-storage capacity each, would enable the Department to furnish this meat regularly to nine-tenths of the troops in these islands, and with these and ice machines and cold storage at large posts losses will be at a minimum and comfort at a maximum.

The Department, when it is possible to obtain it, furnishes 100 pounds of ice per day to each company, using all that it can get from the ice factories here, about 10 tons per day.

The new ice and cold-storage plant went into operation about June 13, and will enable the Department to obtain an ample supply of ice, and also render the supply of fresh meat more certain.

This cold-storage plant was originally asked for by this Department, but it has been transferred to the insular government, from whom ice is to be purchased and storage rented.

The supply of fresh vegetables has been ample when possible to get them to the troops, and considering the perishable nature of these important articles of the ration and the distance from which they must be brought—America, Japan, China, India, and Australia—they are of excellent quality. When it was impossible to ship fresh vegetables, desiccated potatoes and onions have been furnished.

A fine article, called beef stew, in one and two ration cans, containing a full quantity of beef and vegetables, has been furnished, and where fresh beef and vegetables can not be obtained it is an excellent substitute. Its perfect keeping quality has yet to be determined.

The new emergency ration recommended by an army board, made under the direction of the Subsistence Department, has arrived, and from successful experiments made in the States it is expected to be of great value for detached service and scouting.

Nearly every report, contrary to the idea of the theorists, indicates that the present army ration is about perfect for service in the Tropics. The recent addition to the amount of sugar, and the addition of pickles, leaves but little to be desired, although many competent to express an opinion desire more fresh meat; and it is a significant fact that the more abundant the issue of beef the less is the number on the sick report. Unless rice is forced upon the troops, they will take beans seven-tenths of the time and thrive upon them.

It was found that the native ration, with its 2 pounds of rice and a little meat, did not keep the native prisoners in as good health as the army ration. The army ration was frequently recommended by the surgeons as a cure for beri-beri.

Upon the recommendation of this office a new ration for native troops and one for prisoners was established, resulting in some saving in the cost and giving a variety better constituted to keep them in a healthy condition.

During the period covered by this report about 35,000 men have been returned to the United States, and about 18,000 have arrived from China and the United States, and, so far as this office is informed, not a single serious complaint has been received of the food supplied.

Under the direction of the present depot commissary, Maj. B. K. West, business is thoroughly systematized, efficiently managed, and, save for a lack of sufficient warehouse room (a deficiency which has existed from the first occupancy), everything is satisfactory.

From July 1, 1900, to June 30, 1901, there was received at the depot (net weight):

	Pounds.
Ration articles	116, 554, 830
Sales stores	62, 444, 996
Total	178, 999, 826

Amount shipped out of depot during same period (net weight):

	Pounds.
Ration articles	111, 771, 509
Sales stores	57, 022, 671
Total	168, 794, 180

When it is understood that every pound of these amounts has to be carried on the backs of men (they will not use trucks) from 50 to 400 feet, in and out, and often

piled in stacks more than 40 feet in height, checked twice going in and twice going out, the immense amount of work to be performed and care to be exercised can be appreciated.

There has been some deterioration of stores, due to poor storage and climatic conditions. There is an accumulation of some stores, due to radical changes in the nature of field operations, from extended movements on a large scale to numerous short ones from many posts, in small numbers; to changes in the needs and desires of troops, which could not be foreseen, and to the long time (six months at least) that must elapse between calling for stores and learning the actual demand after arriving at posts; but this is being corrected by reduction in the amounts called for.

There have been thefts, due partly to petty pilferings by laborers. This office had some bamboo tryers, intended for abstracting articles from sacks, which were taken from natives. There has been stealing on the coasts between vessels and the warehouses, and between warehouses and vessels, and when en route to distant posts. That is, the principal losses occur when the stores are not under the control or custody of the Subsistence Department, and some at the depots, but every effort has been made to reduce all this to a minimum.

Report of stores lost, stolen, condemned, etc.

Depot commissary and city of Manila:	
Stores missing from original packages.....	\$418. 90
Stores condemned.....	35, 638. 30
Stores lost.....	23, 946. 35
Total.....	\$60, 003. 64
Department Northern Luzon (including depot):	
Stores condemned.....	98, 602. 39
Stores lost in transit.....	7, 207. 61
Stores stolen.....	5, 075. 15
Stores lost by fire.....	4, 235. 09
Total.....	115, 120. 24
Department Southern Luzon (including depot):	
Stores damaged (condemned).....	66, 606. 26
Shortage (stores missing).....	11, 907. 23
Stores stolen.....	7, 343. 36
Total.....	85, 856. 85
Sales commissary, Manila, P. I.:	
Stores condemned.....	8, 469. 40
Stores missing (lost in transit).....	1, 741. 97
Total.....	10, 211. 37
Department Mindanao and Jolo:	
Stores condemned.....	13, 250. 00
Stores, shortage.....	3, 400. 00
Stores stolen.....	111. 00
Total.....	16, 761. 00
Department of Visayas:	
Stores condemned.....	30, 563. 29
Stores, shortage.....	7, 183. 20
Stores stolen.....	167. 59
Destroyed by insurgents.....	5, 599. 59
Total.....	43, 513. 67
Grand total.....	331, 466. 77

Recapitulation.

Stores condemned.....	\$253, 129. 64
Shortage (lost in transit).....	55, 386. 36
Stolen.....	13, 116. 09
Destroyed by insurgents.....	5, 599. 59
Lost by fire.....	4, 235. 09
Total.....	331, 466. 77

As the total value of the stores handled was about \$16,500,000, this represented a loss of 2 per cent from all causes, not taking into account the amount received from sale of condemned stores and collected from transportation companies for stores lost or stolen en route, the exact amounts of which have not been reported to this office.

The following amounts of subsistence funds were received from different sources between July 20, 1900, and June 30, 1901:

Received from Maj. E. E. Dravo, commissary of subsistence, U. S. A	\$474, 639. 38
Placed to credit with assistant treasurers United States ..	1, 075, 000. 00
Sent from United States in cash	370, 000. 00
Received for sales of stores	1, 412, 742. 77
	<u>\$3, 332, 382. 15</u>

The following subsistence funds have been disbursed:

Placed to credit of Treasurer United States	650, 789. 58
Transfer of funds to officers	437, 755. 61
Disbursements	1, 947, 992. 99
	<u>3, 036, 538. 18</u>

Leaving balance on hand June 30, 1901 295, 843. 97

The average amount paid for commutation of rations to men on special duty, when it was impracticable for them to mess with any organization or utilize rations in kind, was \$6,204.47. This is gradually being reduced, amounting in August, 1900, to \$8,181.50, and in June, 1901, to \$5,461.50.

Manila was designated as the depot of supply for troops operating in China, and arrangements were made for supplying the command (consisting of 12,300 troops and 3,200 marines, a total of 15,500 men, or 3,250,000 rations and a corresponding amount of sales stores) until May 1, 1901, but owing to the reduction in the number of troops retained, and the fact that each body of troops took with it about a sixty-days' supply, it was only necessary to send a limited amount of supplies.

The total cost to the subsistence department in Manila of the army in China up to June 30, 1901, was as follows:

Cost of rations	\$152, 614. 17
Cost of sales stores	110, 434. 83
Cost of property	1, 156. 03
Cost of stewards' department	36, 000. 00
Funds transferred	22, 000. 00
Total	<u>322, 205. 03</u>

It is with regret that this office feels called upon to notice certain attacks by the press upon the Subsistence Department, as the result of an investigation instituted by this office. Had these reports confined themselves to the facts, as ascertained by this investigation, it would not be necessary to advert to this subject now, but the result was temporarily to make a national scandal, to involve the names of innocent persons, and malign the Subsistence Department.

It is with the purpose of showing the absolute injustice of these attacks that these remarks are made.

A summary of these reports is as follows:

(1) That, in the administration of the Subsistence Department, vast frauds, involving thousands upon thousands of dollars, had been committed against the Government.

(2) That the chief commissary received from a contractor the free use of a house and its furnishings.

(3) That champagne had been illegally purchased by the Subsistence Department.

Taking these allegations seriatim:

This office was well aware that the conditions here were such as to perplex and throw the greatest temptation in the way of poorly paid noncommissioned officers and inexperienced volunteer officers whom it was necessary to charge with the care and distribution of stores. It was for this reason that ceaseless vigilance was exercised by this office, with the hearty support and concurrence of the division commander, to prevent any illegal disposition of subsistence stores, such as is liable to occur where such vast quantities are handled in times of war and with poor facilities for handling; where work has to be done nights as well as days; where sales are being made to so many irresponsible parties; where the market price of all food products is about double that charged by the Subsistence Department, and many unobtainable elsewhere at any price, thus presenting the greatest possible temptation to speculation. In November, 1900, at the request of this office, the provost-marshal placed detectives upon this work, but nothing came of it.

On March 11 a rumor reached this office that an officer had received a rebate or commission. This was investigated by the assistant to the chief commissary and a report substantiating the allegation was submitted by this office to the division commander. This officer has been tried by court-martial and convicted.

Later the secret service police were directed to investigate the unlawful disposition of subsistence stores hereinbefore mentioned. The chief of the secret service consulted with this office. Such assistance as was desired, including a special inspector, was furnished that officer, and vigorous action, such as was possible only under martial law, was taken. Houses were searched, books seized, arrests made, prisoners placed incommunicado, etc., but this office was not responsible for the methods pursued. In all, stores to the value of \$3,800 were seized. Part of this was flour exchanged by organizations legitimately for bread; part was savings made by returning troops and disposed of against division orders before sailing; part from the abuse of privilege of purchase; and part, say one-fourth, was undoubtedly stolen. Thus far part of these stores, to the value of \$927.99, have been claimed and recommended to be returned.

Two officers were tried and convicted—one for shipping in from Calamba some 50 cases of bacon, valued at \$324, part of the seized stores above mentioned; the other for disposing of the same. This was a matter not connected with the Subsistence Department, except that the bacon was taken from its stores.

Six commissary sergeants were arrested. Three of these have been tried and convicted—one for taking and disposing of stores to the value of \$705, one for taking and disposing of stores to the value of \$73, and one for taking and disposing of stores to the value of \$50.75, a total of \$828.75. The other three, after being held for two months, and their conduct subjected to the most rigorous examination, have been released.

Take the case of one of the released sergeants as an illustration. The only evidence against him was the supposed surplus of about 100,000 pounds of flour, which was due to a clerical error in placing 111 sacks of flour (11,100 pounds) upon an abstract as 111,000 pounds.

In behalf of the three convicted sergeants it is but just to say that they have each for twenty years borne most honorable records and for months performed most arduous duties, and were in charge of warehouses containing stores to the value of hundreds of thousands of dollars; in one month about 25,000,000 pounds of subsistence stores, worth about \$2,500,000, passed through the custody of these sergeants.

On March 11 this office learned that a party had said the chief commissary was occupying a house furnished him by a contractor. This was at once reported by the chief commissary in person to the division commander, who had the matter investigated. The real estate agent who rented the house and the contractor named both testified under oath that the report was false, and it was also in evidence that the chief commissary was paying \$125, Mexican, per month for his residence. One month later this rumor was cabled all over the world as a news and as a fact.

The allegations that champagne was illegally purchased in February and March was undoubtedly added to make the "commissary scandal" seem as heinous as possible. No illegal purchases of champagne have ever been made by this office. The purchase was ordered discontinued in December last and not a bottle purchased thereafter. None was purchased in February or March, though one small lot, purchased months before, was delivered in February. But however the purchase of champagne may be regarded in the United States, a business management which enabled our sick and debilitated troops to purchase the best brands of imported champagne at 82 cents per pint is not regarded by line or medical officers here as scandalous, and there are to-day soldiers on duty in the United States who, but for the champagne supplied by the Subsistence Department, would be resting in metallic-lined caskets.

This office has every reason to believe that the efforts of the Department have been appreciated, and that its affairs have been conducted so as to reflect honor upon the service and give satisfaction to the officers and enlisted men who are so dependent upon its successful management, and for whose comfort and well-being it is primarily intended.

The thanks of this office are due for the unflagging exertions and loyalty of subordinate officers, especially the chief commissaries of the departments of Northern and Southern Luzon, Majors Niskern and Ruthers, to whom credit is largely due for the success which has attended the operations of this Department. My personal thanks are due to Maj. R. L. Bullard, Capt. H. E. Wilkins, and Capt. Thomas Franklin, who were in turn assistants in this office, for faithful service and intelligent hard work. The services of the commissary sergeants have been invaluable; those stationed in this city have worked every day in the week and often nights; that three

fell before great temptation is regretted more by this office than anywhere else. The clerical force has been pushed almost to the limit of human endurance, and while many lacked experience, they made up for it in zeal and long hours.

Very respectfully, your obedient servant,

C. A. WOODRUFF,

Colonel, Assistant Commissary-General, United States Army, Chief Commissary.

REPORT OF CHIEF COMMISSARY, DEPARTMENT OF NORTHERN LUZON.

HEADQUARTERS DEPARTMENT OF NORTHERN LUZON,
OFFICE OF CHIEF COMMISSARY,
Manila, P. I., May 11, 1901.

The COMMISSARY-GENERAL OF SUBSISTENCE, U. S. A.,
Washington, D. C.

(Through chief commissary, division of the Philippines.)

SIR: I have the honor to submit the following report of operations of the Subsistence Department in this department for part of the fiscal year ending June 30, 1901. I regret that the necessity of a sick leave prevents me from including in this report the operations of the remaining six weeks of the year.

Troops supplied.

Up to January 28, 1901, there were present in the Department of Northern Luzon 27,000 troops and something over 4,000 prisoners and civilian employees. The strength of the department on April 30, 1901, was 25,578 officers and men and several thousand prisoners and civilian employees. These troops garrison 238 towns.

Until April 30, 1901, the following was the district organization of the subsistence department in this department:

First district.—Capt. Ralph Ingalls, assistant commissary of subsistence, U. S. V., depot commissary at Vigan and chief commissary of the district.

Second district.—Capt. John E. Woodward, assistant commissary of subsistence, U. S. V., depot commissary at Aparri and chief commissary of the district.

Third district.—Capt. H. L. Street, assistant commissary of subsistence, U. S. V., depot commissary at Dagupan and chief commissary of the district.

Fourth district.—Capt. F. H. Pomeroy, assistant commissary of subsistence, U. S. V., depot commissary at San Isidro and chief commissary of the district.

Fifth district.—First Lieut. John Kennedy, Forty-first Infantry, U. S. V., depot commissary at Angeles and chief commissary of the district.

Sixth district.—First Lieut. Philip Powers, Forty-second Infantry, U. S. V., chief commissary of the district.

On September 17, 1900, the subdepot at Rosales was discontinued and Captain Street was ordered to the depot at Dagupan to relieve Captain Pomeroy, who was ordered to San Isidro.

On May 1, 1901, the fourth and fifth districts were consolidated, becoming the new fourth district, the depot remaining at San Isidro, and on the same date Lieutenants Powers and Kennedy were relieved as district commissaries in order to accompany their regiments to the United States, the subdepot at Angeles being discontinued.

On April 20, 1901, Capt. John E. Woodward, assistant commissary of subsistence, U. S. V., was ordered to relieve Capt. H. E. Ely, Twenty-sixth Infantry, as depot commissary for the department of Northern Luzon, Manila, P. I.

On May 6, 1901, First Lieut. H. H. Pattison, regimental commissary Third Cavalry, was ordered to relieve Capt. Ralph Ingalls, assistant commissary of subsistence, U. S. V., and First Lieut. W. D. Davis, regimental commissary, Seventeenth Infantry, was ordered to relieve Capt. H. L. Street, assistant commissary of subsistence, U. S. V., to enable these two officers to comply with orders directing them to proceed to the United States for muster out of the service.

Department depot.

This depot, established by General Orders, No. 30, Headquarters Division of the Philippines, series 1900, has made all shipments of stores to subdepots and stations in the department. The depot was established in order to meet the peculiar conditions existing in Manila, to facilitate and secure prompter shipment of stores to troops in the department. It has handled and shipped to subdepots and other stations 40,000 tons gross of subsistence stores during the period July 1, 1900, to April

30, 1901, inclusive. It has met emergencies, and has given to the department a more rapid system of shipments of stores than existed under former conditions.

Nevertheless, the existence of a general subsistence depot and a department depot in the same city only a few hundred yards apart is inconsistent, causing excessive and frequent rehandling of stores and heavy additional operating expenses; I therefore recommend that on June 30, 1901, such depot be discontinued.

It is believed that a well-organized general depot, having several commissary officers as assistants to look after the interests of the large departments, would meet the requirements of the supply, and save to the Government many thousands of dollars expended in operating expenses and extra handling of stores; especially in view of the fact that after June 30, 1901, the number of troops in the department will have been materially reduced, will have settled down to more normal conditions, and the problem of supply will be far less difficult.

First Lieut. H. E. Ely, Twenty-second Infantry (now captain, Twenty-sixth Infantry), has been in charge of this depot since it was established. His work has been constant and laborious, and he deserves commendation.

Subdepots.

The subdepots supply troops in their districts not nearer Manila or more convenient of supply direct from the department depot in this city, which supplies nearly as many stations as all the subdepots combined. There are a number of contributing stations which supply nearly as many troops as several of the subdepots.

Supply.

All troops in the department are fully supplied to include the period June 30, 1901. The first and second districts are supplied for the rainy season to include November 30, and the supplies for the rainy season for the other districts, to include October 31 and November 30, have been ordered, and stores are being shipped as rapidly as possible. It is intended that all troops in the department dependent on water or wagon transportation shall have in their hands by May 31, or not later than June 15, supplies for the rainy season, to include October 31 and November 30. Some perishable stores, such as frozen meat, fresh vegetables, and a few other perishable articles, will have to be supplied monthly.

The troops have been generously supplied, not only with every component of the ration, but with an extensive line of stores for sale, over 60 articles of which have never been supplied to any military post in the United States. No troops in garrisons in the United States were ever supplied as liberally, or with food of better quality, than those in this department during the past year. The Subsistence Department has exerted its full power, energy, and thought to meet every demand made upon it. The sick report since July, 1900, has been reduced about 50 per cent, and it is due largely to the unhesitating subordination of the Subsistence Department to the health and comfort of the troops, sparing nothing which would promote an efficient condition of supply. That the work of the Subsistence Department during the past year has not been in vain is attested by the universal commendation of all officers and soldiers serving in this department.

The supply of 27,000 troops in one body, or in five or six field commands, is a simple proposition compared with the supply of the same number scattered in 238 field stations. Troops on the march constantly engaged require few sale stores, but in garrison, with intermittent scouts and field operations in a country destitute of food supplies of a nature to which American troops have been accustomed, the demand for such stores is far greater in quantity and variety than anything known in the United States. The quantities and varieties are needed because officers and men are wholly dependent on the Subsistence Department, and climatic influences cause capriciousness of appetites never known in our country. There is an alternate longing for sweets and acids, necessitating the supply of great quantities of candy, jams, preserves, pickles, and sauerkraut.

Fresh-beef supply.

With the exception of two battalions stationed on the Zambales coast and several stations in the fourth district, all troops in the third, fourth, fifth, and sixth districts have received a regular supply of from six to seven-tenths frozen beef and 100 pounds of ice daily per company. The two battalions on the Zambales coast and the troops in the first district and part of the second district are now receiving about two-tenths frozen beef, supplemented by small quantities of native beef, roast beef, and beef stew.

Until a few months ago the second district received an ample supply of native beef, by purchase of beef cattle in several islands north of Luzon, delivered at Aparri and distributed on the hoof to stations up the river, but rinderpest swept this section, killing many cattle—some of our own—and stopping further handling of beef cattle in that district. Some native beef is now being purchased within the district.

Epidemics of rinderpest in several districts, the great depletion of native cattle from such disease, and consumption by the troops has presented a problem difficult to solve in connection with the supply of native beef or beef cattle obtained from any locality. If beef cattle had been brought from Australia or the Straits Settlements they probably would have died from disease. However, the risk will have to be taken and beef cattle purchased and brought from these two countries unless we can secure sufficient transportation for our unlimited supply of frozen beef, at a cost of about 40 per cent less than is now being paid for inferior native beef in this island, or would have to be paid for imported beef cattle.

A full supply of frozen beef has been pushed to every station where transportation could be secured for it. On one line it leaves a station on the railroad and goes by Australian bull carts and carabao carts for 60 miles into the interior, arriving in excellent condition. On another line it goes by such carts and by pack mules 20 miles of the distance over a mountain trail. For a long time these sections were infested with ladrones, or bands of insurgents, who offered no molestation. It is probable that the native drivers or owners of carts paid toll from their earnings.

If suitable and sufficient water transportation was provided, nearly all the troops in this department would receive from six-tenths to seven-tenths frozen beef. During the time that 27,000 troops were in the department all except 2,000 could have received a six-tenths supply of this beef. It was the simple question of getting two small ships to take this beef from Manila to nine coast points, from which there would have been no difficulty in transporting this beef into the interior. No difficulty has been experienced in securing the necessary land and river transportation under the control of the department commander and his chief quartermaster. For a long time there were 7,000 troops in the first district, which were supplied from six distributing points, viz, San Fernando, Candon, Vigan, Salomague, Laoag, and Bangui. If transportation repeatedly requested had been given me for delivery of frozen beef to these six places I could have given to every man in this district six-tenths frozen beef, and to most of them a supply of ice.

I have been exceedingly anxious to supply all troops with frozen beef, because I know it influences the sick report more than any component of the ration. I have found that where I have succeeded in supplying this beef to troops who have never received it before, the sick report has been quickly and materially reduced. There has been always an unlimited quantity of frozen beef at Manila at a cost of 6 to 7 cents per pound, while in the sections where I could not get it delivered, inferior native beef, hard to find, was purchased at an average cost of 11 cents per pound, and usually eaten before the animal heat was out of it. It would be far wiser to furnish liberal water transportation for transportation of frozen beef and economize in expense in some other direction, even to the extent of a one-half reduction of stores for sale. Experience convinces me that besides good bread, first-class refrigerated beef, frozen solid, as this is, will keep more effective rifles in ranks than anything else supplied to troops in any climate. I am an apostle of the economic expenditure of Government funds but never at the expense of health of troops and consequent reduction in the number of effective rifles, particularly in a time of war.

Last summer I requested that two small ships, fitted with refrigerators, be placed at the disposal of the subsistence department of Northern Luzon, for the purpose of supplying frozen beef and all other subsistence stores to the 10,000 troops dependent solely on water transportation. I thought that such transportation would be the most economical and would give the most satisfactory results in the supply of these troops.

Recently one small steamer was fitted with an ice box—thanks to the generous assistance of Maj. Thomas Cruse, depot quartermaster—and this boat is now doing good work, which is supplemented by ice boxes put on commercial steamers, thus giving the two-tenths supply of frozen beef already mentioned. One more boat is needed and there is some hope of its being provided.

Transportation of food supplies.

The Manila and Dagupan Railroad is used to transport stores to troops stationed at points on that line, and to stations convenient of supply from it. Coast and river points are supplied by means of ocean and river steamers, bancas, and cascoes. A few stations require the use of pack mules. Inland transportation, consisting of one

short railroad, a few light-draft river steamers, army wagons, bancas, caecoes, and a motly array of Australian bull and carabao carts, has given good service and excellent satisfaction. This transportation has moved through the hostile country infested with ladrones or detachments of insurgents, but the stores lost or damaged have been remarkably insignificant.

Until very recently ocean transportation has been a source of embarrassment in the supply of food to 10,000 troops wholly dependent upon it. It has been the means of extraordinary losses of valuable subsistence stores, which have been badly damaged, wholly destroyed, or have disappeared from the face of the earth. Few shipments have been delivered without subsequent action of a board of survey to adjust heavy losses.

Roast beef.

The demand for roast beef has been very great, as it has been extensively used by the troops in this department, and has given excellent satisfaction. No fault can be found with a good quality of roast beef where there are facilities for cooking, but it should never be used without being cooked. It is needed in large quantities during the rainy and typhoon season; should be of best quality of beef, packed in cans of not greater than 2 pounds weight.

Beef stew.

Beef stew and vegetables (potatoes and onions) is the finest component of the ration, except bread and refrigerated beef, ever issued to the troops. It will take the place of fresh beef when it can not be supplied better than any other meat. It is excellent for hikes and rapid field operations. A ration can of beef stew and vegetables, a pound of hard bread in tin, a tablet of chocolate, or coffee, sugar, and salt would be superior and more acceptable to troops than any emergency ration ever manufactured. Large quantities of beef stew are needed in this department.

Standard emergency ration.

The standard emergency ration has given satisfaction. Its use alone has enabled troops to operate in mud and water up to their necks, and without transportation; it was the only ration we had for a time that could go through rain, rivers, and mud. Since the receipt of beef stew in large quantities, it has largely supplanted the emergency ration, and is being used extensively for hikes. The troops are enthusiastic over beef stew, and if some hard bread was provided in 1-pound tins there would be little or no call for any so-called emergency ration.

Desiccated vegetables.

Such vegetables are required in large quantities during the rainy and typhoon season, which includes the period June 1 to November 30, inclusive, when land and water transportation meet many obstacles.

Food of American soldiers in the tropics.

Contrary to theory, practical demonstration proves beyond a doubt that American soldiers serving in these islands need the full army ration with the addition of more sugar. The same amount of first-class fresh beef is required as in Montana; health can not be maintained without an abundance of nutritious food carefully prepared. The foreign population in these islands and the wealthy natives are just as heavy eaters as are Americans; besides they use a great deal of Scotch whisky and red wine. The poor masses live on rice and fish, but not from choice. They are anemic and full of skin diseases as the result of an impoverishing diet. Native scouts fed on the army ration soon get fat, change in appearance, and gain strength. In a number of instances many native prisoners of war, and other natives convicted of crimes, have been received at prisons suffering from berri-berri or other skin diseases. The surgeons recommended the issue of the army ration, stating that such diseases were the result of an impoverishing diet of rice and fish. These diseases seem to have rapidly disappeared under the benign influences of the army ration.

It has been suggested by some persons (not company commanders or their men) that a special ration should be issued American troops serving in the tropics, but practical demonstration does not support any such opinions founded upon theory. Company, troop, and battery commanders recommend no change in the ration except an increase in the amount of sugar, and the issue of oatmeal.

Deterioration of stores.

The Department has suffered some losses of stores from fire, severe climatic influences, and poor storage facilities to be found in most of the numerous towns and villages occupied by the troops. The long rainy season is very severe on stores not packed in tins, particularly on flour and bacon packed in crates. This office has taken every measure to minimize such losses.

Some recommendations.

The Subsistence Department should have its own appropriation for the purchase or hire of transportation, rent of warehouses and offices. It is too dependent for transportation of food supplies upon another department which is naturally more concerned over the shipment of its own stores than those of another department, and in times of great stress may result in failure to deliver sufficient food to troops at the right time; yet, the responsibility will always be laid at the door of the department which can not turn a wheel except at the pleasure of the department controlling all transportation. No department should be in a position to handicap the successful operations of another, and each should be placed upon a basis so as to preclude any recriminations.

At least half the flour and bacon should be packed in tin, flour the same as hard bread is now. I do not think any other form of packing will meet all the conditions; the sacks receive rough handling and are often torn and not infrequently require resacking after delivery by merchant steamers to coast points. Bacon should be packed in 9-pound tins for general use and some in three-quarter-pound tins for hikes and rapid field operations. We are smoking the crate bacon with very good results. At each station there is a little smokehouse, and our losses of this article through climatic influences have been very much reduced. Stores packed in tin and subject to fermentation should have the cans well lacquered to prevent corrosion, either from dampness or the contents of fermenting cans.

All stores are of very fine quality and have given entire satisfaction. The long list of sale stores, especially the canned vegetables, have given great comfort to the troops serving in these islands.

Among the many capable officers who have performed subsistence duties in the department who deserve praise I desire to mention Capt. John E. Woodward, assistant commissary of subsistence, U. S. V., who has had charge of a remote district where it was necessary that he have considerable latitude of action. He has shown fine judgment and special capacity for subsistence duties.

First Lieut. T. T. Frissell, regimental commissary Third Infantry, has been in charge of a large distributing station doing nearly as much work as several of the subdepots. The care given to stores, the neatness of his warehouse, and the high character of his work all merit praise. First Lieut. W. F. Creary, regimental commissary Twelfth Infantry, has been a careful and efficient commissary.

First Lieut. John Kennedy, Forty-first Infantry, U. S. V., and First Lieut. Philip Powers, Forty-second U. S. V., have shown marked ability and efficiency as commissaries.

My thanks are extended to all commissaries who have served in this department for their assistance and untiring efforts in the supply of troops while in camp and during extensive field operations.

I also desire to express my appreciation of the assistance given me by Maj. Thomas Cruse, recently assigned to duty as depot quartermaster of the division, and to Maj. R. R. Stevens, chief quartermaster of the department, who have done everything in their power to facilitate the shipment of food supplies, and to Col. C. A. Woodruff, chief commissary of the division, for his loyal and unfailing support with all the power of his office.

To the department commander, General Wheaton, I am grateful for his unquestioned support and commendation of the work performed by the Subsistence Department of northern Luzon since July, 1900.

Very respectfully, your obedient servant,

G. W. RUTHERS,

Major and Commissary of Subsistence, Volunteers, Chief Commissary.

[Inclosure.]

Extract from the report of Lieut. Col. P. W. West, inspector-general, Department of Northern Luzon, dated May 14, 1901.

The reports of the inspectors and my own personal observation convince me that the conditions in the department as regards the supply of the troops have improved considerably since the inspections were first started. The troops are well fed and are supplied with everything that can be desired, with the exception of some of the inaccessible posts, where, so far, it has been found impossible to supply them with fresh beef; but every effort is being made to overcome the obstacles, and it is expected that before long every post except those of the far interior will have fresh beef at least once or twice a week. If beef on the hoof could be used it would be a simple matter to have an ample supply, but this is impossible, for wherever they have introduced cattle the animals have died by the hundreds of rinderpest. The board of health of Manila is now carrying on extensive experiments with the hope of stamping out this dreadful disease, and if this is ever accomplished the most difficult problem that the commissary department has had to face will be solved. I will add here that the troops throughout this department speak in the highest terms of the way the commissary department has supplied them with stores during the past six or seven months, and the inspectors have called attention to very few errors and defects in this department. * * *

The above, taken from the report of the department inspector, furnished for my information.

G. W. RUTHERS,
Major, Commissary, U. S. V.,
Chief Commissary, Department of Northern Luzon.

REPORT OF CHIEF COMMISSARY, DEPARTMENT OF SOUTHERN LUZON.

HEADQUARTERS DEPARTMENT OF SOUTHERN LUZON,
OFFICE CHIEF COMMISSARY,
Manila, P. I., July 12, 1901.

The COMMISSARY-GENERAL, U. S. A., Washington, D. C.
(Through Chief Commissary, Division Philippines.)

SIR: In compliance with your letter of February 19, 1901, I have the honor to submit herewith the following report of the operations of the subsistence department under my supervision in the Department of Southern Luzon for the fiscal year ending June 30, 1901.

I reported for duty as chief commissary, Department of Southern Luzon, in obedience to paragraph 2, Special Orders, No. 57, Division of the Philippines, June 9, 1900, on July 20, 1900, the duties of the office being performed from July 1 until that time by Maj. I. W. Littell, quartermaster, U. S. V.

On assuming my duties the strength of the department was 15,750 men, divided among 82 stations. Since that time the strength of the department and the number of stations have varied considerably, the greatest number of men on duty in the department being during the month of November, 1900, when it reached 20,835. The number of troops for the month ending June 30, 1901, was 14,205, the number of stations with issue and sales commissaries being 55; substations, 59. Of the total number of stations 38 are reached by water transportation and the balance by wagon or pack transportation, over varying distances, the maximum being about 40 miles. Most of the roads in the rainy season are almost impassable.

During the entire year there have been many changes of troops and new stations have been established. The greatest changes in troops have, of course, taken place with the return of the volunteers. Owing to the uncertainty as to when particular garrisons of volunteers might be relieved, and whether by garrisons of regulars of equal number, or, owing to lack of troops, of less numbers down to a small detachment, the question of a proper supply of subsistence stores during the period of these changes promised to be perplexing; but by assuming that the new garrisons would be equal in numbers to the old, a sufficient supply was assured and the result has been satisfactory. There have been no unwieldy surpluses in consequence.

On assuming charge I found it impossible to ascertain from the records of the office to what date the stations were supplied, what stores were on hand, due, or

needed. Accordingly a telegram was sent to the commanding officers of all stations having telegraphic communication and letters to the others requesting that their commissaries be directed to report, by wire where possible, the number of complete rations on hand; also, if any articles of the ration were not on hand in sufficient quantities, to report the quantities required to complete the ration supply to October 31, 1900, and to report the more necessary articles and quantities of sales stores needed for the same period. The replies to these requests revealed the fact that almost all stations were short from one to five components of the ration and many articles of sales stores.

This condition was found as above stated, although the stocking of the majority of the stations throughout the department for the rainy season, which was then on, had been given as one of the reasons for the then great deficiency which existed in the depots in Manila.

From July until October, 1900, it was a constant struggle to divide the few available stores so as to meet the most necessary calls. Canned milk, other supplies for the sick, chewing and other tobacco, butter, lard, bacon, and rice are a few of the articles the supply of which was unequal to the demand. In September supplies began to arrive, and by November there was an abundance. Since that time there has been no cause for complaint. During this period of comparative famine many complaints from commanding officers were received regarding the deficiency.

As soon as it was possible to get reports of stores it was discovered that of some of the articles short there were many stations in the interior which were greatly overstocked. Could these surpluses have been reached, they would have helped to relieve the situation, but the roads were almost impassable, and this, together with the very serious shortage in wagon or pack transportation, made such action out of the question.

The subsistence supply depot of the department, established by General Orders, No. 30, Division of the Philippines, June 11, 1900, had been organized a few weeks prior to my arrival and was in charge of Capt. Charles S. Campbell, Thirty-eighth U. S. V., who, with shortage in supplies, poor facilities, insufficient clerks, and greatly cramped quarters, as well as most vexatious water transportation, earnestly and faithfully seconded the efforts of this office to send out the necessary stores. At the request of his colonel, and contrary to the desires of this office, he was relieved. Captain N. P. Pavey, Thirty-eighth U. S. V., was next detailed. He was relieved by Capt. H. G. Cole, assistant commissary of subsistence, U. S. V., September 20, 1900.

Captain Cole has been most efficient in the performance of his duty. He has worked harmoniously both with the Quartermaster's Department and this office. For some time after Captain Cole took charge of his office the affairs of the water-transportation department were conducted in a most unsatisfactory and trying manner, but through it all Captain Cole showed great patience and persistence. This action on his part, together with his executive ability manifested in the affairs of his depot, resulted in rapid improvement in the handling and movement of his stores and has proven of great assistance to this office.

The building assigned for the use of both the quartermaster and subsistence supply depots for the department was wholly inadequate to accommodate the two departments, and as a result much inconvenience and unnecessary labor was caused the depot commissary, who was forced to work in cramped quarters. In November, 1900, after various requests for additional storage room, the Quartermaster's Department was directed to secure other facilities for the depot quartermaster, and the entire building was turned over to the depot commissary. The present facilities give room for storage in a very congested condition, and all shipments must be prepared in the street.

Boards of survey have been exceedingly numerous, the losses determined thereby since July 20, 1900, being as follows:

Damaged stores	\$66,606.26
Shortages	11,907.23
Stolen	7,343.36
Total	85,856.85

The losses under the heading "stolen" were determined definitely as such, although under the heading "shortages" there were undoubtedly many losses caused by theft, but not so determined by the boards.

The greater part of the loss of the damaged stores was caused by spoiled vegetables, deteriorated flour, and crated bacon. The losses, though apparently large, were unavoidable. Numerous losses resulted from the fact that some of the stations were heavily overstocked for the rainy season.

Advantage has to be taken of every opportunity to ship vegetables to the outlying posts on the southern coast of the island of Luzon and to the other islands in the department. Shipments, as far as practicable, are made direct, but as the itinerary of the merchant vessels generally includes five or six ports of call with many delays, some posts must go entirely without vegetables, or a proportion of the vegetables shipped must be delayed in arrival at their destination for a week or more after loading. Small deck space prevents the loading, in most cases, of the vegetables on deck.

The losses by theft are also unavoidable. This petty thieving still continues, and there seems to be no way to put an end to it as long as the loading of ships has to be accomplished by means of cascoes where the stores can not be placed under lock and key and which harbor two or more families of natives. However, some of the heaviest losses by theft have occurred while stores were being transported by Government transports, either with or without guards of soldiers. Until stores can be kept under lock and key till delivery this thievery will continue. It is understood that the officer at present in charge of the water transportation is working with this end in view.

The total amount of stores and property shipped by the depot commissary of this department, from October 1, 1900, to June 30, 1901, is as follows:

Month.	Vegetables.	Beef.	Ice.	Ration stores.	Sales stores.	Property.
October.....	470,587	140,221	21,234	2,274,825	897,904	5,061
November.....	617,078	125,099	28,300	3,063,793	967,174	1,549
December.....	775,832	126,287	50,250	3,701,153	1,228,451	18,353
January.....	623,575	115,697	50,525	1,620,153	476,148	121,429
February.....	574,889	109,349	70,970	1,214,004	278,604	6,990
March.....	518,958	105,798	72,280	1,354,514	307,658	4,303
April.....	414,970	84,834	65,095	1,131,757	323,894	3,966
May.....	455,247	134,597	72,175	2,518,148	917,267	3,580
June.....	395,473	94,167	85,700	1,315,851	301,005	1,731
Total.....	4,846,609	1,036,039	516,529	18,194,198	5,698,105	165,962

Grand total, 30,475,442 pounds.

In the item of ration and sales stores and property the weights given above are gross. No record is available preceding October 1, 1900.

This work, including accounting for the stores and property, has been done at a cost to the Subsistence Department for clerks, laborers, including repacking, and a double handling of all stores (due to receiving and shipping out stores) amounting to \$1.42 per ton. Exclusive of clerks, the cost has been \$1.05 per ton.

The transportation of stores in this department is entirely by water, or overland by wagon or pack train. All stores sent out from the depot go by water transportation to coast stations. Many of these coast stations are used as distributing commissaries, some having issue and sales commissaries dependent upon them, and also substations to whom they make issues.

At present the affairs of the water transportation office are ably handled and no great difficulty is experienced in getting rations and sales stores, exclusive of fresh beef, vegetables, and ice to the coast towns. But it is only since Maj. J. B. Ale-shire, quartermaster, U. S. A., took charge of the water transportation office that any material improvement has been made, and the problem is yet far from being solved. At nearly all of the distributing stations there is still a lack of sufficient land transportation. With the exception of a very few coast towns, to which commercial ships do not go, fresh vegetables are shipped with comparative regularity, but for reasons stated above they do not always arrive in the best of condition. Lack of refrigerator ships has prevented fresh-beef shipments to all the posts. These shipments have, however, been extended as the supply of ice and increased regularity in sailing of merchant steamers have allowed.

Telegraphic communications have been extended so that nearly all the stations in Luzon Island can now be reached. The stations in the other islands have no communication except by steamer. As referred to above, some have almost no arrival and departure of ships, others occasional steamers, say once a month, and others at least weekly steamers, and hence a more or less irregular mail service. This condition, affecting as it does the receipt of requisitions and reports, has been a source of great annoyance and anxiety to this office, and has rendered the problem of supply much more difficult of solution.

General Orders, No. 58, Headquarters Department of Southern Luzon, series 1900, published information in regard to requisitions for stores and property, reports of stores, and distributing commissaries. A new order, embracing some minor changes, made some months ago by circular letter, was issued June 24, 1901. Instructions in regard to subsistence matters in general were so thoroughly covered in General

Orders, No. 75, Division of the Philippines, that it was not thought necessary to go any further into detail in the departmental order.

Posts in the first district, with exception of Mauban, Antimonan, and Guinayan-gan, being within comparatively easy access of Manila, are instructed to make requisitions monthly, covering periods of four months. Posts in the third and fourth districts and the three posts mentioned, being far distant from Manila, and facilities for transportation to them being few and uncertain, they were instructed to require for stores on a seven months' basis. With better transportation facilities these periods could be reduced, and the posts would consequently have newer stock on hand, but with the present means it is not thought advisable to shorten the time.

Owing to many and frequent changes of garrisons and for other reasons not understood by this office it has been a hard task, in many instances, to secure a compliance with existing orders relating to subsistence affairs. A great many officers have seemed to attach but little importance to the necessity of forwarding promptly their reports and requisitions, and the supply has consequently been hampered, to say nothing of the additional and unnecessary labor in this office that has been caused by this apparent indifference. Stations hardest to communicate with have been the worst offenders in these matters. As a consequence of this neglect by the stations, this office has had to exercise extraordinary care, and frequently has shipped rations on its own volition after waiting for the necessary requisitions until the existing ration period was about to expire, the shipment being made so as to arrive before the expiration of such period. Stations that have done their duty regarding requisitions and reports have never complained, since there has been an abundance of stores in Manila. The only serious complaint of a shortage of ration articles was made by one of the offenders mentioned above, and this complaint would not have been made except for the fact that the rations shipped on the initiative of this office had been loaded on a ship that, before delivery of the stores, ran on a coral reef in an unfrequented part of the coast of Luzon, thereby causing an entirely unlooked-for delay in the delivery of her cargo. Some of these same offenders have complained of a shortage of sales stores, but the defense of this office has invariably been "nonreceipt of the requisition required by orders," and as a consequence the offense has never been repeated.

In the language of the office there are three classes of coast stations, viz: "Laguna," "near-by," and "distant," stations. "Laguna" stations are on the Laguna de Bay and reached now triweekly on a regular schedule by Government launch. "Near-by" stations are those on the coast of Luzon including those in Manila Bay, reached by Government launch on regular trips. "Distant" stations are all of the remainder and reached from once a week, with practical regularity, to occasionally by a Government vessel when there is an absolute necessity therefor.

To the "Laguna" points the delivery of fresh beef, fresh vegetables, and ice is satisfactory. And from these points fresh beef is carried into the interior to sixteen stations, the greatest distance being about 35 miles. In other words, all of the ten stations and sixteen substations dependent upon "Laguna" points are regularly supplied with fresh beef and fresh vegetables, and, with a few exceptions, ice. This latter is not supplied to all, from lack of sufficient and suitable transportation. To "near-by" points a triweekly service of fresh beef, vegetables, and ice is also given. At present this service goes down the coast of Luzon about 25 miles, and supplies three stations and eight substations. Recently another launch has been put on which it is hoped, will serve with biweekly trips, and thereby add to the "near-by" points five stations and nineteen substations, this launch going down the coast a distance of about 175 miles. These latter five stations and their substations have for a number of months been receiving their full supply of vegetables, but not regularly, and to the five stations fresh beef has been shipped whenever practicable.

To the "distant" points shipments of vegetables have been made at every opportunity, and they have been fairly well supplied with vegetables; in fact, so well supplied that the demand for canned tomatoes and desiccated vegetables has been comparatively light, but to the most distant posts occasional shipments only can be made. Now that the supply of ice has become sufficient, it is hoped that the cooperation of the Quartermaster's Department will result in a service to these "distant" points of weekly and less frequent shipments of fresh beef and ice. Efforts are now being made with that end in view. Except for a supply of beef, in this manner the "distant" points must and have depended solely upon preserved or canned meats. There is practically no beef on the hoof in the country, and the chief commissary of the division has fruitlessly exhausted his efforts to secure the delivery of beef on the hoof. At the same time an attempt to use beef on the hoof might result disastrously, as the country seems to be full of the germs of the disease that has already caused the death of practically all the cattle in the department. With ships of light draft, having cold storage, frozen beef could be supplied to all the troops in the department, and ice to nearly all of them.

Storage for subsistence supplies at the posts in the department is reported, with a few exceptions, adequate and satisfactory. Where storage is not satisfactory or ample the commissary has been directed to take proper steps for securing what may be necessary.

The variety of sales stores, judging from reports received by this office from all posts in the department, has given good satisfaction to all. Frequently, however, articles not on the list have been called for, and some of the articles added to the list for the Philippines have not been on hand in sufficient quantities. The fact that both officers and men are obliged to depend entirely on the commissary for the many articles of food and conveniences they have been accustomed to in the States, and that use here can not be made of the system of purchases of "exceptional articles," makes the officers and men fully appreciate the liberality of the department, and at the same time is a very strong reason for making the list of stores as large as possible. In this respect the isolation of a frontier garrison in the States is metropolitan compared with that of a large majority of the stations in the department.

Bakeries are in operation at all posts, with a very few exceptions. Those posts that have not the Blodgett oven on hand have been instructed to make request therefor.

Owing to the fact that mail communication between posts in the same district must be made via Manila, the attempt to make use of district chief commissaries was abandoned as soon as the necessary orders could be issued after I entered upon my duties in this office. This action has greatly facilitated the movement of requisitions and reports and greatly simplified the problem of supply.

With the subsistence supply depot in such good hands as those of Captain Cole, and the distributing commissaries in the hands of capable line officers, this office has not felt the absence of officers of the Subsistence Department.

The lack of post commissary-sergeants has been a burden that has borne heavily on this office, and this burden has grown no lighter with the exchange of volunteer for regular troops. With the volunteers there were more officers at stations for duty and more enlisted men out of whom good clerks could be made. At present every regular officer seems to be greatly overworked, many of the stations having no more than two officers and some but one for duty; even passable clerks are rare; and many of the lieutenants have no knowledge of the duties pertaining to a commissary. These things, together with the fact of such a large number of substations dependent for stores, put the affairs in the Subsistence Department of many stations on a very unsatisfactory basis, and make the demand for commissary-sergeants most urgent.

A list of the stations of the department, showing the frequency with which fresh beef, vegetables, and ice are received, is inclosed herewith.

Very respectfully,

A. D. NISKERN,

Major and Commissary, U. S. A., Chief Commissary.

[First Indorsement.]

HEADQUARTERS DIVISION OF THE PHILIPPINES,
OFFICE OF THE CHIEF COMMISSARY,
Manila, P. I., August 29, 1901.

Respectfully forwarded to the Commissary-General, U. S. A., Washington, D. C.
Through mistake of this office this report was not forwarded promptly.

C. A. WOODRUFF,

Colonel, A. C. G., U. S. Army, Chief Commissary.

NEAR-BY POSTS.

Posts.	Province.	Beef.	Ice.	Vegetables.	
Exposition barracks.	Manila	Daily	Daily	Trimonthly ..	
Las Pintas ¹	do .....	.....	.....	.....
Maricabon ¹	do .....	.....	.....	.....
Muntinlupa ²	do	Triweekly ..	Triweekly ..	Trimonthly ..	
Paranaque ¹	do .....	.....	.....	.....
Pasay cavalry barracks ²	do	Daily	Daily	Trimonthly ..	
Santa Anna	do	do	do	do	Headquarters First district.
Taguig ²	do	Triweekly ..	Triweekly ..	do	
San Pedro Mecati ¹	do .....	.....	.....	.....
Bacoar ¹	Cavite .....	.....	.....	.....

¹ Native troops.

² Issue and sales commissary at post.

NEAR-BY POSTS—Continued.

Posts.	Province.	Beef.	Ice.	Vegetables.	
Imus (distributing commissary). ¹	Cavite	Triweekly ..	Triweekly ..	Trimonthly ..	
Cavite Vello ..	do	do	do	do	Subpost of Imus.
Dasmariñas ..	do	do	do	do	Do.
Silang	do	do	do	do	Do.
Corregidor	do	Daily	Daily	do	
Indang ¹	do	Triweekly ..	Triweekly ..	do	
Naic ¹	do	do	do	do	
Maragondon ..	do	do	do	do	Subpost of Naic.
Santa Cruz (distributing commissary). ¹	do	Triweekly ..	Triweekly ..	Trimonthly ..	
Noveleta	do	do	do	do	Subpost of Santa Cruz.
Rosario	do	do	do	do	Do.
San Francisco de Malabon.	do	do	do	do	Do.
Balayan ¹	Batangas ..	Weekly	Weekly	do	
Batangas (distributing commissary). ¹	do	do	do	do	
Bauan	do	do	do	do	Subpost of Batangas.
Lipa ¹	do	do	do	do	Do.
San Jose ¹	do	do	do	do	Do.
Nasugbu ¹	do	do	do	Bimonthly ..	
Taal ¹	do	do	do	do	
Calaca	do	do	do	do	Subpost of Taal.
Spanish Fort ..	do	do	do	do	Do.
Lucena (distributing commissary). ¹	Tayabas ..	Bimonthly ..	Bimonthly ..	do	
Candalaria	do	do	do	do	Subpost of Lucena.
Lucban ¹	do	do	do	do	Do.
Sariaya ¹	do	Bimonthly ..	do	do	Do.
Tayabas ¹	do	do	do	do	Do.
Tison ¹	do	do	do	do	Do.
Pagbilao	do	do	do	do	Do.
Laguimancoc ¹ ..	do	do	do	do	Do.
Unison	do	do	do	do	Do.
Pitogo	do	do	do	do	Do.
Macalelon	do	do	do	do	Do.
Catanauan ¹	do	do	do	do	Do.
Mulaney	do	do	do	do	Do.
Bondog	do	do	do	do	Do.

LAGUNA POSTS.

Binan ¹	Laguna	Triweekly ..	Triweekly ..	Trimonthly ..	
Cabuyao	do	do	do	do	Subpost of Binan.
Santa Rosa	do	do	do	do	Do.
Carmona	do	do	do	do	Do.
Bay ¹	do	do	do	do	
Los Baños ¹	do	do	do	do	
Calamba (distributing commissary). ¹	do	do	Daily	do	
Aliminos	do	do	Triweekly ..	do	Subpost of Calamba.
San Pablo ¹	do	do	do	do	Do.
Santo Tomas ¹ ..	do	do	do	do	Do.
Tanauan ¹	Batangas ..	do	do	do	Do.
Santa Cruz (distributing commissary). ¹	Laguna	do	do	do	
Lumbang	do	do	do	do	Subpost of Santa Cruz.
Magdalena ¹	do	do	do	do	Do.
Pagsanjan ¹	do	do	do	do	Do.
Pila	do	do	Triweekly ..	do	Do.
Majayjay ¹	do	do	do	do	
Siniloan ¹	do	Bimonthly ..	do	do	
Mavitac	do	Triweekly ..	do	do	Subpost of Siniloan.
Paete ¹	do	do	do	do	
Panguil	do	do	do	do	Subpost of Paete.
Paquil	do	do	do	do	Do.

¹ Issue and sales commissary at post.

DISTANT POSTS.

Posts.	Province.	Beef.	Ice.	Vegetables.	
Antimonan ¹	Tayabas			Bimonthly	
Gumaca	do			do	Subpost of Anti-
					monan.
Lopez	do			do	Do.
Guinayangan ¹	do			do	
San Narcisco	do			do	Subpost of Guina-
					yanan.
Mauban ¹	do			do	
Legaspi (distributing commissary). ¹	Albay			do	
Albay	do			do	Subpost of Le-
					gaspi.
Camalig	do			do	Do.
Duraga	do			do	Do.
Guinalabtan	do			do	Do.
Ligao	do			do	Do.
Tabaco ¹	do			do	
Nueva Caceras (distributing commissary). ¹	Camarines Sur		Daily	do	
Iriga ¹	do			do	Subpost of Nueva
					Caceras.
Bato	do			do	Do.
Baao	do			do	Do.
Buhí	do			do	Do.
Nabua	do			do	Do.
Calabanga	do			do	Do.
Minalabag	do			do	Do.
Pili	do			do	Do.
Lihmanan ¹	do			do	Do.
Magarao	do			do	Do.
Palangia	do			do	Do.
San Fernando	do			do	Do.
Daet ¹	Camarines Norte			do	
Indan	do			do	Subpost of Daet.
Talisay	do			do	Do.
San Jose de Lagonoy. ¹	Camarines Sur			do	
Goa	do			do	Subpost of San Jose
					de Lagonoy.
Lagonoy	do			do	Do.
Sagay	do			do	Do.
Sabang	do			do	Do.
Tigaon	do			do	
Pasacao ¹	do			do	
San Pascual	Isla de Burias			do	Subpost of Pas-
					caao.
Sorsogon ¹	Sorsogon			do	
Bacon	do			do	Subpost of Somo-
					gon.
Matnog	do			do	Do.
Gubat	do			do	Do.
Bulan ¹	do			do	
Donsol ¹	do			do	
Pandan ¹	Catanduanes Is-			do	
	land.				
Virac ¹	do			do	
Boac (distributing commissary). ¹	Marinduque Is-			do	Headquarters
	land.				Fourth district.
Gazan	do			do	
Santa Cruz ¹	do			do	
Torrijos ¹	do			do	
Masbate ¹	Masbate Island			do	
Catilingan	do			do	Subpost of Mas-
					bate.
Malagros	do			do	Do.
Uson	do			do	Do.
Palanog	do			do	Do.
Romblon ¹	Romblon Island			do	

¹ Issue and sales commissary at post.

REPORT OF CHIEF COMMISSARY, DEPARTMENT OF MINDANAO AND JOLO.

HEADQUARTERS DEPARTMENT OF MINDANAO AND JOLO,
OFFICE OF CHIEF COMMISSARY,
Zamboanga, P. I., July 7, 1901.

The COMMISSARY-GENERAL, U. S. A.,
Washington, D. C.

(Through chief commissary, Division of the Philippines.)

SIR: In compliance with circular letter No. 88593 from your office, I have the honor to report as follows concerning the operations of the Subsistence Department in the Department of Mindanao and Jolo:

I was announced as chief commissary of this department by General Orders, No. 16, Headquarters Department of Mindanao and Jolo, July 12, 1900, relieving Capt. Albert D. Niskern.

This department is now composed of 19 posts, situated on six different islands. The posts on the island of Mindanao, 14 in number, are scattered all around the coast line of the same, and it requires from fourteen to sixteen days to make the trip to all of these posts by steamer. From this you can get some idea of the difficulties confronting me to properly supply fresh vegetables to all these posts. The department has therefore been divided into four parts by me for that purpose, and calls for fresh vegetables are now made in such a way as to secure quick delivery and save loss en route. I do not find that troops suffer when they do not get fresh potatoes and onions. At this place (Zamboanga) troop commanders tell me they can do better with the money value of these articles than with potatoes and onions. This I believe to be general all over the department. The paying of commutation of fresh vegetables to troops is far better than issuing to them the desiccated varieties of these articles. All things considered, the troops of this department have had a good supply of fresh vegetables at all times.

The greatest difficulty confronting me in the supply of the department is to secure a proper supply of fresh beef. There are some five or six posts of the department which are able to supply themselves from herds in the neighborhood of the posts. The others have to depend upon cattle which are imported from other places. The islands composing this department were once well stocked with cattle, but only a few large herds now remain. Cattle have been imported from Borneo to Zamboanga and found to do well, but there is no extensive source of supply.

The Medical Department has constructed at this place in connection with its ice plant a small cold-storage room capable of holding two months' supply of frozen beef for the post of Zamboanga. There are ice plants at Jolo and Cagayan, and efforts are being made to do the same at those places. This, of course, will guarantee to about 1,200 troops a regular supply of fresh beef of the best quality.

This department has at all times during the past year had an abundant supply of stores of first-class quality, and the officers and men of the department have been able to live as well as in the United States. There has been very little sickness among the men, and when the volunteers were mobilized here for return to the United States visitors were struck with their healthy appearance. There have been no complaints as to the condition or quality of stores supplied.

Ice plants have been established by the Medical Department at Jolo, Cagayan, and Zamboanga. Ice is purchased from that Department for issue to troops. It does seem, though, that this ice should be sold to the subsistence department at actual cost of manufacture.

The troops in the first district of the department, being eight posts on the north of Mindanao, and the troops in the third district, being the post of Jolo (with its subposts of Siassi and Bongao), are all supplied on calls from this office, made direct on the depot commissary at Manila. The posts on the south of Mindanao are supplied from the depot at Zamboanga. Those in the fourth district, comprising the island of Paragua and Guyo, have been so far supplied from Zamboanga, but the same will hereafter be supplied from Manila. The shipping of stores direct from Manila to the posts where desired results in a better supply, quicker delivery, less loss through repeated handling, and less surplus stores to be carried in the depot at this place. Stores are shipped on "special requisitions" when possible to all posts of the department from the depot at Zamboanga.

In conclusion I desire to repeat that there has not been and could not be any complaint as to quantity and quality of stores supplied this department.

Respectfully submitted.

THEO. B. HACKER,
Captain and Commissary, U. S. A., Chief Commissary.

REPORT OF COMMISSARY AT SALES DEPOT, MANILA.

OFFICE OF THE SUBSISTENCE SALES DEPOT,
Manila, P. I., June 30, 1901.

THE CHIEF COMMISSARY, DIVISION OF THE PHILIPPINES,
Manila, P. I.

SIR: In compliance with letter of instructions from your office, dated April 10, 1901, I have the honor to submit my annual report of the subsistence sales depot in this city.

I reported for duty to Maj. George B. Davis, commissary of subsistence, U. S. V., depot commissary, as his assistant and in charge of sales commissary on September 7, 1900, per paragraph 8, Special Orders, No. 132, dated Headquarters Division of the Philippines, Manila, P. I., September 7, 1900, and, acting for Major Davis, relieved Maj. Carroll Mercer, commissary subsistence, U. S. V., in charge of sales depot.

At that time there were two sales stores, one located at No. 72 Calle Nueva Ermita, and the other at No. 86 Calle Echague Quiapo. A consolidation of these two had, however, been decided upon by the chief commissary, and the building now used was being renovated for the purpose. This consolidation took place on October 4 and 5, and has more than borne out the wisdom of the decision to make the change. The building is known as the Cuartel del Fortin, and located as it is on the south bank of the Pasig River, just above the Bridge of Spain, it is the most central location in the entire city. It is of ample size for even the large business transacted; has storage room for one month's supplies, and a wharf at the rear, so that all stores are transferred direct from the division general depot on caecos that are under the control of the Commissary Department, necessitating very little carrying and handling—a very important point where the supplies handled consist almost entirely of the most costly of all commissary supplies, sales stores—besides making us nearly independent of the wagon transportation of the Quartermaster's Department.

On October 27, 1900, I was relieved from duty as assistant to the depot commissary and assigned to duty in charge of the sales commissary, per Special Orders, No. 172, paragraph 10, dated Headquarters Division of the Philippines, Manila, P. I., receipting to Maj. George B. Davis for all funds, property, and stores of this depot.

This depot supplies all of the officers of the army stationed in Manila, their families, and those of other officers who are living in the city, everything except the actual rations required by the companies and detachments, employees of the War Department, the civil commission and staff, all of the employees of the civil government stationed in the city, the officers of the Navy and Marine Corps both stationed on the ships of the squadron and at the navy-yard in Cavite.

The actual number supplied would be a very difficult item to determine. At present there are 218 officers and 75 companies and detachments purchasing on regular accounts, together with 1,568 civilians and 565 civil policemen. This does not include troops passing through, officers who send in to purchase from nearby posts, nor the navy purchase.

The stores required are received from the depot commissary of the division. A requisition is sent in at the beginning of each month to cover the period to include the 15th of the following month; but as new things are continually arriving at the depot and unexpectedly large sales made here, it becomes necessary to send in small requisitions every few days. These are consolidated and invoiced each Saturday to me by the depot commissary. This method has worked perfectly and allowed of a full supply of all articles to be kept on hand at all times, which would have been impossible, owing to the varying demand, had not the officers who have been in charge of that depot assisted me in every way in their power, often going out of their way to do so.

Fresh vegetables are delivered to the depot as required, and other perishable articles, such as butter, cheese, cream, etc., are set aside in the cold-storage plant subject to orders from this depot only and are removed from there at intervals as required to the large ice box recently erected here.

The sales room is open from 8 o'clock a. m. to 1 o'clock p. m. daily, except Sundays; office hours are from 8 o'clock a. m. to 1 p. m., and from 3 p. m. to 5 p. m. An effort has been made to keep the sales room open later in the afternoon, but has not proven to be desirable, as it would be necessary to close at noon and open again at 2 p. m., and it is especially desirable to have the room open for sales from 12 to 1 o'clock to allow the clerk and other employees time to purchase stores during the time that they can be absent from work, and the two hours from 3 to 5 p. m. are all too short in which to refill the shelves for the following day, put up the orders for delivery the next morning, as well as for the great amount of book work necessary

with so many small purchases, amounting as they do in an average day to from 375 to 400 separate sales and of which a great deal must be done by the salesmen after hours in order to keep down the force of office clerks.

Stores are delivered every morning throughout the entire city by delivery wagons and orders taken for the following day. The meat is delivered at the same time, being cut up at the depot commissary each morning and turned over on a memorandum receipt each day to me, then invoiced in bulk at the end of the month; the system has been a poor one, but made necessary on account of improper facilities for keeping beef in the city. A butcher shop in connection with this depot is nearly completed, which will greatly facilitate the handling and cutting of the meat, and it is the intention of the department to arrange a scale of prices so that the people can buy the cuts of meat that they wish.

The system here has been radically changed in the past year in the way of checks to prevent fraud from within and without.

The officers' accounts that are payable at the end of the month are entered from their pass books into daybooks of the depot and their books then stamped with the word "Entered." No order can be filled at the counter unless stamped. These daybooks are entered into the ledgers at night and at the end of the month the totals of the ledgers and the daybooks must agree.

The cash sales are entered on the authorized cash slips, which are abstracted at night as well as the daybooks, and the sum of the two carried into the stock book; the money value of the stores dropped from the stock book in this manner must equal that taken in as cash plus that charged on the ledgers, giving another check.

The letters of authority given to civilians from your office are kept on file in this office, but it was found that people would come in claiming to have a letter on file when they had not, and time did not allow of the authority being looked up in each case, so a pass book was gotten out for them with the word "Cash" cut out of the cover and with the following signed slip pasted in the inside:

"MANILA, P. I., ——— — 1901.

“———, whose signature appears below, is authorized to purchase subsistence supplies for cash for a mess of ——— persons upon presentation of this book with a list of the articles desired entered therein and signed in each case by himself.

“This book must be presented whenever a purchase is made.”

The stock book which has been in use here for the past six months will, I think, in time prove a valuable book of reference, showing as it does the demand for each and every article carried by the Department.

Everything received is charged up to the storekeeper when received, and as fast as sent to the sales room is receipted for to him; giving an accurate check on each department in case of a shortage.

The cash slips are all machine numbered and must be accounted for; the total of these slips for the day must be turned in in cash at the close of business. The bookkeeper receives the cash for ledger accounts, and the total turned in by him during the month must equal the total of the ledger accounts.

There were no records in this office when I assumed charge, so all records herein date from September 1, 1900.

The following is a statement of the money value of the stores handled, to include June 30, 1901:

Stores received	\$430, 604. 44
Sold—	
September, 1900	\$26, 146. 16
October, 1900	25, 852. 60
November, 1900	35, 753. 01
December, 1900	49, 259. 07
January, 1901	36, 760. 02
February, 1901	41, 452. 10
March, 1901	35, 544. 85
April, 1901	36, 513. 95
May, 1901	38, 752. 63
June, 1901	43, 458. 69
Condemned	7, 496. 72
Missing	1, 741. 97
Balance on hand	51, 872. 67
	<hr/> 430, 604. 44

REPORT OF THE SECRETARY OF WAR.

The following table shows the growth of sales to civilians with their monthly percentage of gross sales:

Month.	Sales.	Per cent.
September, 1900	\$1,088.26	0.0416
October, 1900	1,253.06	.0486
November, 1900	1,990.45	.0556
December, 1900	3,747.21	.0076
January, 1901	3,730.29	.1015
February, 1901	6,597.76	.159
March, 1901	8,533.66	.24
April, 1901	9,551.30	.262
May, 1901	12,361.10	.319
June, 1901	13,415.00	.3066

There has been no difficulty in getting stores, and the full list has been on hand most of the time, reaching at one time over 600 articles.

The stores have been uniformly of the best, and the loss in damaged goods no greater than to be expected in this climate and after having been transported such a great distance.

I have from time to time recommended against carrying certain stores, and will not repeat it here.

I recommend that as an experiment canned goods be subjected to a coat of varnish before shipment to this climate, which will, in my opinion, prevent rust to a great extent, and most of our spoiled canned goods become so from rust, in many cases being nearly eaten up.

As this depot is a fixture in Manila, I recommend that a coffee roaster similar to the one in the depot commissary in Washington, D. C., be installed, and that a large coffee mill be furnished.

Very respectfully,

F. H. LAWTON,
Captain and Commissary, U. S. A., in Charge of Sales Depot.

REPORT OF DEPOT COMMISSARY, MANILA.

OFFICE OF DEPOT COMMISSARY,
Manila, P. I., June 30, 1901.

The CHIEF COMMISSARY, DIVISION OF THE PHILIPPINES,
Manila, P. I.

SIR: I have the honor to submit the following report of the operations of this depot during the fiscal year ending June 30, 1901:

Personnel.

The following is a list of depot commissaries, with dates of relief:

Maj. George B. Davis, commissary of subsistence, U. S. V., November 30, 1900; Capt. James C. Read, acting commissary of subsistence, U. S. V., March 7, 1901; Maj. Barrington K. West, commissary, U. S. A.

Assistants now on duty: Capt. Thomas Franklin, acting commissary of subsistence, U. S. V.; First Lieut. John Kennedy, Forty-first Infantry, U. S. V.; First Lieut. J. C. Lowenberg, Thirty-seventh Infantry, U. S. V.; Second Lieut. J. H. Johnston, Forty-sixth Infantry, U. S. V. * * *

Receipt and shipment of stores.

All stores and property received and distributed in this division are handled by this depot.

When a transport arrives in the harbor her manifest is sent by the Quartermaster's Department to this office, and her cargo is assigned to the various warehouses according to the class of stores. A copy of this order is sent to the officer in charge of the warehouse as his authority for receiving the stores.

Stores are delivered by the Quartermaster's Department at the dock in front of the designated warehouse, and piled according to class. They are then checked, counted, and receipted for by checkers employed by this depot.

Requisitions are received direct from the chief commissaries of the Departments of Northern and Southern Luzon, and stores transferred direct to their depots for distribution. From all other departments and from transports, requisitions come through the chief commissary of the division, and stores are shipped direct to posts from here. Owing to the fact that there were no light-draft boats with ice plants available, the shipment of refrigerated beef has not been as regular as could have been desired. It has been shipped, however, whenever occasion offered.

	Pounds net.
Monthly average of stores received	13, 878, 000
Monthly average of stores shipped	12, 008, 400
Total average of stores handled	25, 886, 400

Making a total of 310,636,800 pounds, net, handled for the year. Besides this there has been rationed by this depot a monthly average of 5,100 men. There has also been received, issued, and sold a monthly average of 803,000 pounds of fresh meat.

Owing to uncertainty of movements of troops in the field these shipments were in nearly all cases "rush" orders. Stores had to be received and despatched in many cases at night and in storms. In most cases Sunday was not a day of rest for employees in this depot. Every pound received and shipped has been handled on the backs of native laborers, and under conditions presently to be mentioned under the head of "Storage facilities."

The multiplicity of small orders has made the paper work of the depot assume vast proportions.

In spite of these difficulties no instance has come to my knowledge of expeditions or transports having been delayed one moment on account of a failure of the Subsistence Department to deliver stores at the day and hour ordered.

Storage facilities.

There are at present four ordinary warehouses, a cold storage warehouse, and about 350,000 cubic feet of the insular government's cold storage in use by this depot.

Warehouse No. 1 is an old Spanish barrack, part of which has been recently assigned to this depot. It is situated about a mile from this office, and is the best adapted of any of the storehouses now occupied for the purposes required.

Warehouse No. 2 is a group of buildings comprising the ration issue, the meat issue, and property warehouses and subwarehouses A, B, C, D, E, and F. The buildings are old Spanish sugarhouses, and are totally inadequate for the purposes required, being so dark that it is impossible to see without artificial light. Floors are very uneven, which, with the high ceilings, makes the piles of stores very insecure. Two natives were recently injured, one mortally, by a pile of stores falling upon them in this storehouse. It is almost a matter of impossibility to get a correct count of stores in this warehouse.

No. 3 warehouse comprises the depot office and subwarehouses A, B, C, and D. It is fairly well adapted for the purposes required. The ceilings are entirely too high, thus necessitating very high stacks, thereby enormously increasing the cost of handling stores.

Warehouse No. 4 is a single building with very high ceilings, and is a long distance from the river front, making it very difficult to deliver and ship stores. It is about half a mile from this office. The same objections against this warehouse exist as against No. 3, on account of high stacks. There are no covered ways or sheds available at any of these warehouses for getting out orders or receiving stores.

These operations have to go on irrespective of weather, and with the frequent and heavy rain storms of this climate perishable stores are frequently damaged without any possibility of preventing it.

Frequently night overtakes a delivery or shipment of stores; in this case they must be left on the open wharf, and though there is a military guard and a night watchman, it is often impossible to prevent petty thieving.

Quality of rations and of stores.

The fresh beef and mutton is purchased and transported by the navy from Australia. It is uniformly of excellent quality. Potatoes and onions are purchased under contract made in the United States, and, considering the difficulty of handling such perishable stores, they have given general satisfaction. Notwithstanding the order of the Commissary-General to the contrary, purchasing officers are still sending sugar-cured bacon here. I am sending out salt-cured bacon purchased in December, 1900, which is in perfect condition. Sugar-cured bacon can hardly stand the trip from the States here without spoiling.

I have nothing but praise for the quality of the other articles of the ration and of stores shipped from the States, and for those purchased here since your arrival.

Irregularities.

On assuming charge of this depot, and acting pursuant to your orders, I made a rigid investigation of its affairs. The result of this investigation has been reported to you from time to time; and with your hearty concurrence and support measures have been taken to correct such irregularities as were discovered, and to prevent a repetition of the same.

Recommendations.

1. That immediate steps be taken to acquire ground located in a suitable place, so that ships can unload direct at the dock; and that suitable and adequate storehouses be built thereon for the use of this depot. If this were done this office could handle the work now done by the three depots with the same office force that is now required for this depot alone, at half the expense for emergency labor. The loss of stores between ship and shore would be entirely eliminated. This I regard as the most pressing need of the Subsistence Department.

2. That fresh meat be purchased by officers of the Subsistence Department and delivered by army transports.

3. That the list of articles supplied be materially reduced.

4. That the sale of subsistence stores be restricted to only those persons authorized by army regulations to purchase.

5. That as soon as possible the navy be required to furnish their own subsistence.

6. That the attention of the Commissary-General be called to the fact that notwithstanding his orders to the contrary, packages are still being delivered covered with advertising matter.

In conclusion, I beg to acknowledge the faithful and conscientious work of my assistants, Capt. Thomas Franklin, A. C. S., U. S. V.; First Lieut. John Kennedy, Forty-first U. S. V. Infantry, and First Lieut. J. G. Lowenberg, Thirty-seventh U. S. V. Infantry.

Very respectfully,

B. K. WEST,

Major and Commissary, U. S. A., Depot Commissary.

DEPORTED PRISONERS AT GUAM.

The following instructions were issued by the chief commissary, Division of the Philippines, to the commissary at Guam, on January 10, 1901, in regard to the subsistence of the deported prisoners on that island:

In deporting natives of some standing to Guam, it is the intention of the division commander that they shall be abundantly supplied with good wholesome food, and that their native servants shall receive "native rations," which is similar to what they have been used to, only more ample and complete.

While you are furnished the regular army ration for these deported prisoners of war, it is suggested that by an economical use of the same, especially of the meat portion thereof, you can provide many changes which will conduce to the health and comfort of the prisoners.

This office will furnish a liberal supply of sales stores from which you can draw extra articles in exchange for articles of the ration. The savings will enable you to furnish a small daily supply of cigarettes, which are almost a necessity to these people.

I fear we shall have difficulty in supplying fresh beef, fresh vegetables and fresh fish, but we will do the best we can for you.

I will furnish you with a supply of funds, for which you will have but little use, except for the payment of your clerk and possibly some fresh fish.

Should you find you are getting short of any article, please give me all the notice practicable, for communication with Guam is slow and uncertain.

GALVESTON STORM.

Upon the application of the governor of Texas to the Secretary of War on September 10, 1900, for rations and tentage to be sent to the mayor of Galveston for the relief of the storm sufferers at that place,

subsistence stores were, upon the orders of the Acting Secretary of War, sent to the mayor, amounting in value to \$6,194.24. There does not seem to have been any arrangement made with the governor or mayor for reimbursing the United States for the money value of these stores, and no payment therefor by the State or city authorities has been made.

DESTITUTE MINERS TRANSPORTED FROM NOME, ALASKA,

On September 5, 1900, the Secretary of War verbally directed that subsistence be furnished to 607 destitutes while en route on U. S. transport *Lawton* from Nome, Alaska, to San Francisco, Cal. The total value of subsistence stores consumed by these passengers was \$1,567.73, of which \$732 was refunded by the passengers themselves, leaving \$835.73 unpaid. No reimbursement to the appropriation for the subsistence of the Army has yet been made on account of this remainder due.

ESTABLISHED RATION OF THE UNITED STATES ARMY.

The board of officers appointed to consider and report upon the composition of the ration for the use of troops in tropical climates having reported in favor of a ration which, by substitutions among its various ingredients, would be found suitable for troops in all climates, the question of the adoption of such a ration became one of great importance. Upon a thorough examination of the matter it was found that legislation was necessary, and accordingly legislation was obtained in section 40 of the act approved February 2, 1901, to "increase the efficiency of the permanent military establishment of the United States." The ration established for the United States Army by Executive order under this law was set forth in General Orders, No. 56, Headquarters of the Army, April 23, 1901.

THE EMERGENCY RATION.

The board of officers, convened by Special Orders, No. 295, Headquarters of the Army, 1899, to whom was referred the subject of investigating and reporting upon a suitable ration for use of troops under emergency, made their report to the Adjutant-General of the Army on January 29, 1901. The official action which was taken by superior authority upon the report, together with the report of proceedings of the board, will be found appended hereto, marked Appendix IV. There have been prepared and sent to the Philippines 50,000 of the emergency rations recommended by the board for use in those islands.

SUBSISTENCE STORES FOR SALES IN THE FIELD.

I had the honor, on July 12, 1900, to invite the attention of the Secretary of War, by memorandum, to the evil under existing regulations of sending into the field with troops engaged in active operations excessive quantities and varieties of subsistence stores for sales. On my recommendation this memorandum was referred for consideration to the board of officers which was then in session on the tropical and emergency ration. The board rendered its report on July 14, 1900,

which, on being referred by the Adjutant-General to the Commissary-General for remark, was returned on July 25, 1900, with the following indorsement, since which time no official information has reached this office as to any action being taken to correct the evil complained of:

Sections 1144, 1145, 1149, 1299, 1300, and 1301 of the Revised Statutes, and a clause in the army appropriation act of February 12, 1895, prescribe as a duty of the Subsistence Department the purchasing and keeping on hand of articles designated by the Secretary of War, on the recommendation of the Inspector-General, for sales to officers and enlisted men of the Army.

The operation of these sections of law was found of easy application in time of peace at the various posts, and during the campaigns against the hostile Indians, when the forces were not large and the problem of transportation was not so important.

When an army operates in the field, it is utterly impossible to think of supplying the large list of stores which are authorized to be kept by the Subsistence Department for sales.

The list submitted by the board is approved, and it is recommended that before the same is published in General Orders these proceedings be referred to the Inspector-General for his remarks.

ISSUES TO ORGANIZATIONS OF ENLISTED MEN IN THE PHILIPPINES DURING PERIODS OF CONVALESCENCE.

Upon the application of the commanding general, Division of the Philippines, in August, 1900, the following authority was given for the issue of rations differing from the ordinary rations to enlisted men in the Philippines who are organized into companies of convalescents while recuperating from the effects of unhealthy regions or debilitating climates:

WASHINGTON, August 15, 1900.

MACARTHUR, Manila:

With reference to your telegram of 14th, Secretary of War authorizes issue rations if done under direction Chief Commissary, and convalescents be temporarily organized into companies, or partial companies, as distinguished from convalescents here and there. In latter case ordinary ration thought sufficient. No savings on substitute rations allowed.

CORBIN.

SUBSISTENCE FUNDS HELD IN HAND FOR READY DISBURSEMENT.

A bill (S. 2870) giving authority to all officers intrusted with the disbursement of subsistence funds to hold restricted amounts of such funds in their personal possession passed the Senate March 24, 1900, and was referred to the Committee on Military Affairs of the House on March 27, 1900, but was not reached for action. I urgently request the honorable the Secretary of War to use endeavors to have the bill passed at the coming session, as the measure is not only one which is promotive of discipline but is one of justice to enlisted men. The bill as it passed the Senate was in the form recommended by this office, and was as follows:

AN ACT concerning disbursing officers of the Subsistence Department of the Army.

Be it enacted by the Senate and House of Representatives of the United States of America in Congress assembled, That officers intrusted with the disbursement of funds for the subsistence of the Army are hereby authorized to keep, at their own risk, in their personal possession for disbursement, such restricted amounts of subsistence funds for facilitating payments of small amounts to public creditors as shall from time to time be authorized by the Secretary of War.

The condition of the existing law and of the regulations on the subject is fully set forth in House. Doc. No. 309, Fifty-sixth Congress, first session, and in Senate Report No. 412, same session. The exigencies of the public service require an open disregard of the restrictions of the existing laws in cities where the treasurer or an assistant treasurer is located. Such a state of affairs should engage the attention of the lawmaking power. The rule of the House prohibiting the incorporation in an appropriation bill of any provision changing existing law compels a resort to general legislation such as above requested.

AUTHORITY FOR DISPOSITION OF SUBSISTENCE STORES NO LONGER
NEEDED.

I have the honor to again urge upon the Secretary of War the need of legislation authorizing the sale at public auction of subsistence stores in good condition which may at any time accumulate in excess at any depot or point of supply and which can not advantageously or economically be transported to other points for issue or sale to troops. The draft of a bill to accomplish the object desired heretofore submitted by this office is as follows:

Be it enacted by the Senate and House of Representatives of the United States of America in Congress assembled, That the Secretary of War may cause to be sold at public sale, under regulations to be prescribed by him, such subsistence stores in good condition intended for issue or of sales to officers and enlisted men as may from time to time accumulate at any subsistence depot, military post, or in the field, in excess of amounts required for use and which can not, with economy and advantage, be shipped to other subsistence depots, posts, or places for military use, the proceeds to be immediately available for general disbursement, under the appropriation for subsistence of the Army current at the time of sale, for any of the objects contemplated by that appropriation.

As the proceeds of all sales of subsistence supplies are, by the act of March 3, 1875 (18 Stat. L., 410), now "exempt from being covered into the Treasury," and are made "immediately available for the purchase of fresh supplies," the above proposed legislation is in exact accord with existing law as to disposition of proceeds of authorized sales of subsistence supplies. There is no law, however, authorizing the sale to the public of subsistence supplies in bulk which are in good condition, the only legislation bearing on the subject of sales of military supplies (section 1236, R. S.) being general in its nature and providing only for the sale of stores, which, upon proper inspection or survey, appear to be "damaged," or "unsuitable for the public service." As all public sales of subsistence supplies in good condition in bulk now taking place are being made under the guise of the stores being "unsuitable," and such an appropriation of the wording of section 1236 to cover transactions which would else be without even the color of authority of law is strained and unsatisfactory, I earnestly recommend that the above draft of law be pressed upon the attention of Congress.

As illustrating the wastefulness which is consequent upon the absence of a law authorizing the public sale of subsistence stores in good condition which in the vicissitudes of service have been left as surplus at distribution points in spite of all reasonable foresight, it may be stated that, in order to avoid total loss to the Government, valuable stores which had been purchased for sales to officers and

enlisted men under section 1144, Revised Statutes, have been issued to enlisted men in place of equal weights of the authorized articles of the ration. A law authorizing the public sale of such stores would have saved the necessity of resorting to such extravagant issues in order to avoid a total loss. The same conditions exist in all sections where rapid removals of troops take place, or where throughout extensive regions troops are withdrawn or discharged.

ARMY BAKERS.

I again reiterate the recommendation that has been made in sixteen annual reports by commissaries-general since 1877 for the enlistment of bakers in the service.

TRAINING SCHOOL FOR ARMY COOKS.

I also renew my recommendation of last year for the establishment of one or more schools for the training of cooks and bakers for the service. The Medical Department has established a school for teaching the art of cooking to the Hospital Corps and was given an appropriation in the army appropriation act of last session for the purpose. A competent knowledge of the art of cooking is as necessary for those who cook for well men as for those who cook for the sick. It is hoped that the Secretary of War will urge the Military Committee of the House to favorably consider the above proposition and request that committee to recommend to the Appropriations Committee the insertion of an item in the army appropriation bill authorizing and appropriating for the training schools proposed. An appropriation of \$25,000 would be sufficient for preliminary preparation and equipment.

POST COMMISSARY-SERGEANTS.

The number of post commissary-sergeants in the service at the beginning of the year was 167. During the year 48 were appointed, 10 were discharged, 12 were retired, and 4 died, leaving 189 in the service at the end of the year.

Number of claims on hand received and disposed of during the fiscal year ending June 30, 1901.

	Claims for commutation of rations—		Total.
	While held as prisoner of war in rebel States.	While on furlough, and miscellaneous claims.	
There were on hand June 30, 1900.....	3	8	11
Received during the fiscal year.....	325	421	746
Total.....	328	429	757
Disposed of during the year.....	323	425	748
On hand June 30, 1901.....	5	4	9

The number of letters, indorsements, and postal cards written during the year in connection with the above claims was 1,618.

Statement of accounts current and returns on hand June 30, 1900; received and examined during fiscal year ended June 30, 1901, and on hand at close of the fiscal year awaiting examination.

	Accounts current.	Returns of stores.	Returns of property.	Total.
On hand June 30, 1900	187	159	27	373
Received during fiscal year 1901	6,665	5,615	2,044	14,324
Total	6,852	5,774	2,071	14,697
Examined during year	6,062	4,198	1,810	12,070
On hand June 30, 1901	790	1,576	261	2,627

The examination of the accounts current required the verification of 99,060 vouchers; the returns of subsistence stores 48,173, and returns of subsistence property 4,717 vouchers.

In connection with the examinations, 6,084 postal cards were used, and 7,025 letters and 3,314 indorsements written and recorded, 1,141 papers copied, and 1,340 days of time on unclassifiable work consumed.

Contracts for subsistence stores to the number of 505, and for meals, recruiting parties, and recruits to the number of 430 (total 935), were acted on and disposed of during the year.

Certificates of service as acting commissary were issued to the number of 497, and certificates of nonindebtedness to the number of 1,687.

CLERICAL FORCE OF THE OFFICE OF THE COMMISSARY-GENERAL.

The great increase in the number of accounts and returns remaining on hand to be examined on June 30, 1901, over the number remaining on hand at the close of the fiscal year 1900, as shown by the above tables, is accounted for by the fact that a greater number of accounts and returns were rendered during the past fiscal year than were rendered in the preceding year, while the clerical force engaged upon such examination has remained numerically the same. A great drawback to celerity in the performance of clerical work in this office is the want of adequate space, many of the rooms being crowded beyond a reasonable capacity, and there being a lack of sufficient room for the files. Although efforts were made at the beginning of the war with Spain to obtain a proper allowance of space in the War Department building for the increased force of clerks in this office made necessary by that war, no success has ever been achieved, and the office remains to-day in the same crowded condition that characterized it in 1898. The increase of work has caused an increase in the number of hours' labor required from clerks during the past year.

OFFICERS OF THE SUBSISTENCE DEPARTMENT.

On July 26, 1900, Major Dravo was ordered from Manila to Taku, China, there to take charge of commissary work until the arrival of Major Gallagher. He arrived there August 17, 1900, and was relieved by Major Gallagher August 23, satisfactorily performing the duties that fell to his lot. The effective work of the Subsistence Department in China, from beginning to end, was done by Major Gallagher and Captains Ramsey, Franklin, and Bean, and I have heard nothing from

any source except in praise of their efficiency. From the Manila end of the line, Colonel Woodruff was charged with forwarding supplies as required for by Major Gallagher; from the San Francisco end, Major Baldwin. This office knows full well how efficiently this work was done.

In Manila all subsistence duties were under the direction of Colonel Woodruff, who was ably assisted by Major Niskern and Captain Ruthers as chief commissaries of the Departments of Southern and Northern Luzon, respectively, to whose able reports attention is especially invited; also by Maj. B. K. West, who had charge of the depot at Manila, assisted by Captain Franklin. Work could not have been done more efficiently or more satisfactorily than was done by these officers.

Maj. D. L. Brainard, commissary, the purchasing commissary at New York, ably conducted the business of purchasing and forwarding supplies for the use of troops in the Philippines, Cuba, and Porto Rico, as well as in the United States; and Maj. W. H. Baldwin, commissary, the purchasing commissary at San Francisco, performed the duty of purchasing and forwarding supplies for the troops in the Philippines, China, and Hawaii, and in the United States, with the energy and ability which is characteristic of this officer.

The remaining duties of the Department, such as those of chief commissaries and depot or purchasing commissaries, were performed in all cases in an entirely competent and satisfactory manner.

The subjoined list, marked Appendix II, shows the officers of the Subsistence Department and their duties on July 1, 1901.

Appendix III shows the commissary-sergeants who were in service on June 30, 1901.

Respectfully submitted.

J. F. WESTON,
Commissary-General.

THE SECRETARY OF WAR.

APPENDIX I.

Financial statement, showing resources, expenditures, and balances of the Subsistence Department for the fiscal year ending June 30, 1901.

RESOURCES.

	Relief of sufferers from overflow of the Mississippi River, act Apr. 7, 1897.	Subsistence of the Army, certified claims.	Subsistence of the Army, 1898.	Subsistence of the Army, Jan. 1, 1899.	Subsistence of the Army, 1899.	Subsistence of the Army, 1900.	Subsistence of the Army, 1901.
Amounts in the Treasury to the credit of the appropriations of the Subsistence Department, June 30, 1900.	\$125,962.06			\$68,873.41	\$502,835.79	\$3,197,711.65	
Amounts which were reported in the last annual report as being to the credit of officers of the Subsistence Department and of officers doing duty in the Subsistence Department with the Treasurer, assistant treasurers, designated depositaries, and fiscal agents of the Government, and in their personal possession, on June 30, 1900.			\$1,215.00	26,034.54	44,362.54	1,096,264.30	
Amounts refunded to the Treasury near close of fiscal year 1900.				13,995.58	1,449.33	44,431.51	
Amounts carried to the credit of the appropriations.							
Amounts appropriated for the subsistence of the Army for the fiscal year ending June 30, 1901:							\$10,556,492.75
Act May 26, 1900.		\$199.31					5,300,000.00
Deficiency act March 3, 1901.			28.64				
Amount of war appropriation warrant No. 31.							
Amounts collected from various sources and refunded to the appropriations of the Subsistence Department on the books of the Treasury during the fiscal year 1901.			3.00	6,261.91	4,372.28	16,355.48	45,154.94
Amounts charged against officers on account of funds alleged to have been lost by theft, etc., for which relief can only be obtained in the Court of Claims, under sections 1059 and 1062, Revised Statutes, or from Congress, as follows:							
Officers still in service.				195.18	308.27	189.06	
Officers out of service.					540.00		
Amounts received by officers of the Subsistence Department and by officers doing duty in the Subsistence Department from sales of subsistence stores during part of the fiscal year 1900, and during the fiscal year 1901, and taken up for immediate disbursement so far as reported to this office at the date of this report.				776.16	2,090.18	103,428.52	3,290,234.52
Amounts taken up by officers doing duty in the Subsistence Department on account of refundments and reclamations for stores lost, damaged, etc., in correction of errors in their accounts, etc., during above period.			2.06	30.00	7.96	744.50	28,438.11
Amount taken up by officers as gains.					1.50	96.28	1,572.64
Amounts taken up by officers unexplained.					6,695.58	835.19	15,462.13
Total resources.	123,962.06	199.31	1,249.90	106,166.78	562,683.43	4,460,066.49	19,237,355.09

Financial statement, showing resources, expenditures, and balances of the Subsistence Department for the fiscal year ending June 30, 1901—Continued.

EXPENDITURES.

	Relief of sufferers from overflow of the Mississippi River, act Apr. 7, 1897.	Subsistence of the Army, certified claims.	Subsistence of the Army, 1898.	Subsistence of the Army, Jan. 1, 1899.	Subsistence of the Army, 1899.	Subsistence of the Army, 1900.	Subsistence of the Army, 1901.
Amounts expended on the books of the Treasury from the appropriations of the Subsistence Department during the fiscal year 1901.	\$1.80	\$199.31	\$28.64	\$46,078.69	\$24,580.45	\$217,682.99	\$142,411.80
Amounts disbursed by officers of the Subsistence Department and officers doing duty in the Subsistence Department during the fiscal year 1901, so far as reported to this office at the date of this report.			937.25	6,998.20	4,298.79	328,940.42	15,478,854.76
Amounts dropped by officers doing duty in the Subsistence Department in connection of errors in their accounts during the fiscal year 1901, so far as reported.				20	42	724.61	1,461.63
Amounts carried to the surplus fund on June 30, 1901, act June 26, 1874.	123,960.26		3.00	41,021.08	75,159.63		
Amounts transferred to subsistence of the Army, 1901, under the provisions of the deficiency act of March 3, 1901.					450,000.00	3,000,000.00	
Amounts of balances unaccounted for by officers whose accounts are in process of settlement.			281.01	11,873.43			
Amounts charged against officers on account of funds alleged to have been stolen, etc., now dropped from this financial statement.				195.18	540.00		
Total expenditures.	123,962.06	199.31	1,249.90	106,166.78	554,579.29	3,547,298.02	15,622,228.19

BALANCES.

Amounts in the Treasury to the credit of the appropriation of the Subsistence Department June 30, 1901.							\$2,428,545.07
Amounts to the credit of officers of the Subsistence Department and of officers doing duty in the Subsistence Department with the Treasurer, assistant treasurers, designated depositaries and fiscal agents of the Government, and in their personal possession, per the latest accounts received to June 30, 1901.						\$4,198.07	1,185,882.91
Amounts refunded to the Treasury near close of fiscal year 1901, but not carried to the credit of the appropriations by June 30, 1901.						3,707.19	12.73
Amounts charged against officers on account of funds alleged to have been lost by theft, etc., for which relief can only be obtained in the Court of Claims under sections 1059 and 1062, Revised Statutes, or from Congress, as follows:							
Officers still in service.					178.88	111.93	1,283.59
Officers out of service.							
Total balances.					8,048.14	912,758.47	3,615,128.90

APPENDIX II.

Roster of the Subsistence Department, U. S. A., July 1, 1901.

Name and rank.	Duty and station.	Assigned to present station.
COMMISSARY-GENERAL.		
<i>With rank of brigadier-general.</i>		
John F. Weston.....	Commissary-General..... En route to the Philippines on official business, per letter A. G. O., June 13, 1901.	Dec. 13, 1900
ASSISTANT COMMISSARIES-GENERAL.		
<i>With rank of colonel.</i>		
Charles A. Woodruff.....	Chief commissary, Division of the Philippines, Manila, P. I.	July 17, 1900
Henry G. Sharpe	Assistant to the Commissary-General, Washington, D. C.	Sept. 15, 1899
	Acting commissary-general.....	June 15, 1901
Frank E. Nye.....	Under orders for duty as chief commissary, Department of the Lakes, Chicago, Ill., per S. O., 288, Headquarters Army, Dec. 8, 1900. Granted four months' leave of absence on surgeon's certificate of disability, per S. O., 55, Headquarters Army, Mar. 8, 1901.	
DEPUTY COMMISSARIES-GENERAL.		
<i>With rank of lieutenant-colonel.</i>		
William L. Alexander	Chief commissary, Department of Cuba, Habana, Cuba.	Apr. 23, 1901
	Depot commissary, Habana, Cuba.....	May 7, 1901
Henry B. Osgood	Purchasing commissary, Boston, Mass.....	July 21, 1899
	On leave for two months from July 1, 1901.	
Edward E. Dravo.....	Chief commissary, Department of the East, Governor's Island, N. Y.	Oct. 17, 1900
Abiel L. Smith.....	Chief commissary, Department of the Lakes, temporarily, and as purchasing commissary, Chicago, Ill. Granted three months' leave of absence, to take effect on or about May 20, 1901, per S. O., 106, Headquarters Army, May 6, 1901. Leave began May 28, 1901.	Apr. 6, 1901
COMMISSARIES.		
<i>With rank of major.</i>		
Tasker H. Bliss.....	Collector of customs for Cuba, port of Habana, Cuba.	Jan. 1, 1899
James N. Allison	Under orders to proceed to Manila, P. I., and report to the commanding general, Division of the Philippines, for assignment to duty, per S. O., 121, Headquarters Army, May 24, 1901.	
William H. Baldwin.....	Purchasing commissary, San Francisco, Cal..... Subsistence superintendent, army transport service, per S. A. T. R. Chief commissary, Department of California, San Francisco, Cal., per S. O., 150, Headquarters Army, June 28, 1901.	Jan. 22, 1897

Roster of the Subsistence Department, U. S. A., July 1, 1901—Continued.

Name and rank.	Duty and station.	Assigned to present station.
COMMISSARIES—continued.		
<i>With rank of major—Continued.</i>		
David L. Brainard.....	Purchasing commissary, New York, N. Y. Granted leave of absence for fifteen days, per S. O., 133, Headquarters Army, June 8, 1901. Leave extended fifteen days, per S. O., 142, Headquarters Army, June 19, 1901.	Sept. 1, 1900
George B. Davis	Depot commissary, Manila, P. I. Granted three months' leave of absence, on surgeon's certificate of disability, with permission to visit United States, beginning Jan. 7, 1901, per S. O., 209, Division Philippines, Dec. 12, 1900. Leave on account of sickness extended three months, per S. O., 62, Headquarters Army, Mar. 16, 1901.	Mar. 1, 1900
Barrington K. West	Temporarily depot commissary, Manila, P. I.	Mar. 7, 1901
Albert D. Niskern	Chief commissary, Department of Southern Luzon, Manila, P. I.	July 20, 1900
Robert L. Bullard	Chief commissary, Department of Northern Luzon, per S. O., 107, Headquarters, Division of the Philippines, Apr. 25, 1901, and G. O., 19, Headquarters, Department of Northern Luzon, May 18, 1901.	
Charles R. Krauthoff.....	Chief commissary, Department of the Columbia, and purchasing commissary, Vancouver Barracks, Wash.	June 4, 1901
	In charge of matters connected with the Subsistence Department on transports sailing from Portland or Puget Sound ports.	June 4, 1901
<i>With rank of captain.</i>		
William H. Bean	Purchasing commissary, St. Louis, Mo	Mar. 25, 1901
William H. Hart	Temporarily chief commissary, Department of the Lakes. Temporarily purchasing commissary, Chicago, Ill.	May 10, 1901 May 28, 1901
Alexander M. Davis.....	Under orders to proceed to Manila, P. I., and report to the commanding general, Division of the Philippines, for assignment to duty, per S. O., 87, Headquarters Army, Apr. 15, 1901.	
Douglas Settle (U. S. Infantry) ¹ ..	Under orders to proceed to Manila, P. I., and report to the commanding general, Division of the Philippines, for assignment to subsistence duty, per S. O., 94, Headquarters Army, Apr. 23, 1901.	
Hugh J. Gallagher	Under orders to proceed to San Francisco, Cal., and report to Commissary-General for instructions, per S. O., 122, Headquarters Army, May 25, 1901.	
George W. Ruthers.....	Granted leave of absence for three months on surgeon's certificate of disability, to take effect upon arrival in the United States, per S. O., 107, Headquarters, Division of the Philippines, Apr. 25, 1901. Arrived in San Francisco June 26, 1901.	
Harry E. Wilkins	Assistant to chief commissary, Division of the Philippines, Manila, P. I.	Apr. 20, 1901
William L. Geary	Assistant to purchasing commissary, San Francisco, Cal.	May 27, 1901
Charles P. Stivers	Chief commissary, Department of the Visayas, and depot commissary, Iloilo, P. I., per S. O., 127, Headquarters, Division of the Philippines, May 18, 1901.	
Henry G. Cole	Depot commissary, Department of Southern Luzon, Manila, P. I.	Sept. 20, 1900

¹ Detailed from the line under sec. 26, act of February 2, 1901.

Roster of the Subsistence Department, U. S. A., July 1, 1901—Continued.

Name and rank.	Duty and station.	Assigned to present station.
COMMISSARIES—continued.		
<i>With rank of captain—Continued.</i>		
Arthur M. Edwards.....	Assistant to the purchasing commissary, San Francisco, Cal., per S. O., 136, Headquarters Army, June 12, 1901. Commissary at the camps, Presidio of San Francisco, Cal., per S. O., 150, Headquarters Army, June 28, 1901.	
John E. Bloom.....	Assistant to the depot commissary, Habana, Cuba.	May 24, 1901
Frank H. Lawton.....	In charge of subsistence sales depot, Manila, P. I..	Oct. 27, 1900
Thomas W. Darrah (U. S. Infantry) ¹	Assistant to the purchasing commissary, New York, N. Y. Acting purchasing commissary during absence of Maj. D. L. Brainard on leave.	May 20, 1901
Thomas Franklin.....	Commission signed June 4, 1901. Assistant to the depot commissary, Manila, P. I., per S. O., 71, Headquarters, Division of the Philippines, March 19, 1901.	Mar. 19, 1901
Frank A. Cook.....	Assistant to the purchasing commissary, Chicago, Ill.	May 28, 1901
William R. Grove.....	Post commissary, Fort Leavenworth, Kans.....	Apr. 26, 1901
Theodore B. Hacker.....	Chief commissary, Department of Mindanao and Jolo, and depot commissary at Zamboanga, island of Mindanao, P. I.	July 13, 1900
Morton J. Henry.....	Post commissary, Washington Barracks, D. C.....	May 20, 1901
Samuel B. Bootes.....	Under orders to be relieved from duty in the Division of the Philippines and proceed to San Francisco, Cal., and report by letter to the Commissary-General for Instructions, per S. O., 121, Headquarters Army, May 24, 1901.	
Frederic H. Pomroy.....	Chief commissary, fourth district, Department of Northern Luzon, and depot commissary, San Isidro, Nueva Ecija, P. I.	Oct. 4, 1900
David B. Case.....	Arrived in San Francisco, Cal., June 21, 1901, from Philippine Islands, pursuant to telegram from Adjutant-General's Office, dated May 27, 1901. Awaiting orders.	
William Elliott.....	Assistant to depot commissary, Manila, P. I., per S. O., 127, Headquarters, Division of the Philippines, May 16, 1901.	
James A. Logan, jr.....	Assistant to purchasing commissary, Chicago, Ill., per S. O., 136, Headquarters Army, June 12, 1901.	
Julius N. Killan.....	Post commissary, Fort Riley, Kans.....	May 14, 1901
Salmon F. Dutton.....	Post commissary, Fort Monroe, Va.....	May 15, 1901
Michael S. Murray.....	Assistant to the Commissary-General, Washington, D. C.	Apr. 17, 1901

¹ Detailed from the line under sec. 26, act of February 2, 1901.

CASUALTIES IN THE SUBSISTENCE DEPARTMENT SINCE OCTOBER 1, 1900.—RETIREMENTS, DISCHARGES, DISMISSALS, AND DEATHS.

Maj. Matt R. Peterson, commissary of subsistence, volunteers (captain, commissary of subsistence, U. S. A.), died of yellow fever at Habana, Cuba, October 17, 1900.

Charles P. Eagan, Commissary-General of Subsistence, with rank of brigadier-general. Restored to duty December 6, 1900, per General Orders, No. 137, Headquarters of the Army, 1900, and retired same day per Special Orders, No. 286, Headquarters of the Army, 1900,

Col. John J. Clague, assistant commissary-general, U. S. A., upon his own application retired from active service by the Secretary of War, under section 1243, R. S., to take effect April, 1, 1901.

Capt. Frank H. Lawton, assistant commissary of subsistence, U. S. V., discharged by Special Orders, No. 65, Headquarters Army, March 20, 1901.

Capt. Henry G. Cole, assistant commissary of subsistence, U. S. V., discharged by Special Orders, No. 65, Headquarters Army, March 20, 1901.

Capt. John E. Woodward, assistant commissary of subsistence, U. S. V., discharged by Special Orders, No. 65, Headquarters Army, March 20, 1901.

Capt. Frank B. Watson, assistant commissary of subsistence, U. S. V., honorably discharged by Special Orders, No. 97, Headquarters Army, April 26, 1901.

Capt. Philip Mothersill, assistant commissary of subsistence, U. S. V., honorably discharged May 31, 1901, by Special Orders, No. 120, Headquarters Army, May 23, 1901.

Maj. Carroll Mercer, commissary of subsistence, U. S. V., honorably discharged June 30, 1901, by Special Orders, No. 120, Headquarters Army, May 23, 1901.

Maj. Oliver E. Wood, commissary of subsistence, U. S. V., honorably discharged in conformity with section 1205, Revised Statutes, by Special Orders, No. 136, Headquarters Army, June 12, 1901.

Capt. Eben B. Fenton, assistant commissary of subsistence, U. S. V., honorably discharged June 30, 1901, by Special Orders, No. 135, Headquarters Army, June 11, 1901.

Capt. James C. Read, assistant commissary of subsistence, U. S. V., dismissed the service by sentence of general court-martial in Philippine Islands and sentenced to three years imprisonment.

Capt. Thomas F. Ryan, assistant commissary of subsistence, U. S. V., honorably discharged June 30, 1901, by Special Orders, No. 144, Headquarters Army, June 21, 1901.

Capt. Harlow L. Street, assistant commissary of subsistence, U. S. V., honorably discharged June 30, 1901, by Special Orders, No. 144, Headquarters Army, June 21, 1901.

Capt. Ralph Ingalls, assistant commissary of subsistence, U. S. V., honorably discharged June 30, 1901, by Special Orders, No. 144, Headquarters Army, June 21, 1901.

Capt. Thomas Franklin, assistant commissary of subsistence, U. S. V., honorably discharged June 20, 1901, by Special Orders, No. 143, Headquarters Army, June 20, 1901.

APPENDIX III.

Roster of post commissary sergeants June 30, 1901.

	Name.	Station.	Assigned to present station.
1	Adams, Frank E.	Mayaguez, P. R.	Aug. 8, 1900
2	Adams, John H.	Fort Niobrara, Nebr.	Oct. 4, 1900
3	Allen, Harry	Manila, P. I.	June 29, 1901
4	Alles, Henry H.	Fort St. Michael, Alaska.	Sept. 11, 1900
5	Ambrose, Edwin F.	Fort McPherson, Ga.	July 2, 1900
6	Appel, Anton.	Fort Brown, Tex.	May 30, 1900
7	Aurig, Gustav	Fort Washington, Md.	Oct. 17, 1900
8	Bader, Charles	Manila, P. I.	June 11, 1901
9	Bantzhaff, George	Fort Douglas, Utah	Oct. 12, 1900
10	Barrett, Henry	Capiz, province of Panay, P. I.	Jan. 1, 1901
11	Baughn, Wesley	Fort Meade, S. Dak.	July 26, 1900
12	Baumann, August	Fort Greble, R. I.	Oct. 5, 1900
13	Beardslee, Lucius W.	Transport Egbert.	May 25, 1901
14	Bitter, John	Relieved from duty at San Juan June 22; awaiting transportation to Fort Screven, Ga., June 30, 1901.	
15	Blake, Patrick J.	Angeles, P. I.	Jan. 18, 1901
16	Bliesener, Charles	Fort Slocum, N. Y.	Jan. 20, 1899
17	Bliss, Fred P.	San Francisco, Cal., awaiting assignment to Fort Flagler, Wash.	
18	Bolton, George	Imus, P. I.	Feb. 22, 1901
19	Bond, Loring A.	Camp McKinley	Aug. 29, 1900
20	Boog, William H.	Transport Liscum	June 1, 1901
21	Borton, Levi N.	Pasay Cavalry Barracks, P. I.	Jan. 6, 1901
22	Britt, Jackson S.	Manila, P. I.	May 24, 1901
23	Brown, John	En route to Fort Yellowstone, Wyo.	
24	Browne, William J.	Fort Wadsworth, N. Y.	Aug. 24, 1900
25	Burgoyne, Stephen F.	Manila, P. I.	June 16, 1901
26	Byrne, Stephen.	San Fernando, P. I.	Nov. 5, 1900
27	Castle, George P.	Benicia Barracks, Cal.	Dec. 15, 1900
28	Chapman, Henry	Fort Robinson, Nebr.	Oct. 19, 1900
29	Cline, William M.	Calamba, P. I.	May 7, 1900
30	Coffman, Herman	Fort Assinniboine, Mont.	Apr. 29, 1900
31	Collins, James	Transport Relief	May 6, 1901
32	Cone, Charles.	Manila, P. I.	Nov. 12, 1900
33	Cornell, Francis B.	Transport Hancock	Dec. 1, 1900
34	Crone, Isidore	Santa Cruz, Laguna, P. I.	Jan. 27, 1901
35	Damus, Carl	Transport Kilpatrick.	Oct. 24, 1900
36	De Birney, Louis V.	Transport Meade	Mar. 7, 1901
37	Denner, Otto	Manila, P. I.	June 2, 1900
38	Derrick, Theodore F.	Madison Barracks, N. Y.	Mar. 19, 1900
39	Dobler, Fred	Awaiting station	June 28, 1901
40	Dolan, Daniel	San Isidro, P. I.	June 1, 1901
41	Dugger, Cyrus F.	Habana, Cuba	June 18, 1901
42	Eckhart, Paul	Ponce, P. R.	Jan. 23, 1901
43	Edmunds, Jules P.	Fort Columbus, N. Y.	Oct. 31, 1899
44	Elchinger, Paul	Fort Terry, N. Y.	Feb. 8, 1901
45	Ellis, George	Fort Banks, Mass.	Nov. 28, 1900
46	Ensslin, Herman E.	Fort Sheridan, Ill.	Oct. 4, 1900
47	Faringhy, Edwin L.	Transport Logan	Apr. 4, 1901
48	Faringhy, William H.	Fort Wayne, Mich.	June 9, 1900
49	Favier, Joseph A.	Awaiting station	June 29, 1901
50	Fern, Arthur	Imus, P. I.	June 18, 1901
51	Flach, John	Fort Warren, Mass.	Apr. 17, 1899
52	Foley, Malachy.	Transport McClellan	May 6, 1901
53	Froelich, Joseph	Valdez, Alaska	Apr. 29, 1900
54	Geiling, George.	Manila, P. I.	Dec. 22, 1900
55	Geminer, Charles L.	Fort Snelling, Minn.	Sept. 22, 1900
56	Glenn, John	Cebu, P. I.	May 25, 1901
57	Gould, Clarence S.	Fort Gibbon, Alaska.	July 27, 1899
58	Green, Howell L.	Manila, P. I.	Nov. 20, 1900
59	Greene, James J.	En route to Sullivan's Island, S. C.	
60	Grigsby, Jet	Fort Davis, Alaska.	Oct. 27, 1900
61	Grum, William	Fort Ethan Allen, Vt.	Sept. 20, 1898
62	Haines, Reginald	West Point, N. Y.	Oct. 1, 1900
63	Hanagan, James	Manila, P. I.	June 15, 1901
64	Harrell, George H.	San Juan, P. R.	June 13, 1901

Roster of post commissary sergeants June 30, 1901—Continued.

	Name.	Station.	Assigned to present station.
65	Harris, Simon P.	Fort Du Cheme, Utah	Oct. 19, 1900
66	Hartlaub, William	Fort Ringgold, Tex.	June 13, 1901
67	Hasty, Elmer H.	Fort Logan H. Roots, Ark.	Apr. 4, 1901
68	Hensley, Henry C.	Fort Morgan, Ala.	Oct. 18, 1900
69	Hindis, Ommo L.	Cabanatuan, P. I.	May 10, 1901
70	Hodge, Elmer	Bacolod, P. I.	May 16, 1901
71	Hogan, John E.	Cayey, P. R.	Dec. 8, 1900
72	Hoskins, Henry A.	Transport Sedgwick	Apr. 9, 1901
73	Imhof, John	Fort Wood, N. Y.	Nov. 20, 1900
74	Jamison, William H.	Fort Keogh, Mont.	Sept. 4, 1900
75	Jansen, Frank	Fort D. A. Russell, Wyo.	Oct. 1, 1900
76	Jennings, James	Fort Washakie, Wyo.	Dec. 15, 1899
77	Jensen, Julius	Transport Sherman	June 4, 1901
78	Jones, Herman B.	Fort Wingate, N. Mex.	Oct. 8, 1900
79	Jones, Thomas H.	Fort Hunt, Va.	July 7, 1899
80	Kaltschmidt, George H.	Fort Mott, N. J.	Jan. 27, 1901
81	Karbach, Jacob	Fort Apache, Ariz.	June 9, 1901
82	Karsten, Charles	Balinag, P. I.	June 11, 1901
83	Kenealy, Patrick	San Juan, P. R.	Mar. 28, 1901
84	Kennedy, John	Awaiting station	May 8, 1901
85	Kidd, Francis	Pekin, China	Sept. 2, 1900
86	Kidwell, Frank A.	Holguin, Cuba	Apr. 26, 1901
87	Klaproth, Harry	Echague, P. I.	Apr. 18, 1901
88	Klein, Charles	Fort Williams, Me.	Jan. 29, 1900
89	Keonig, Otto	Fort Sill, Okla.	Oct. 4, 1900
90	Kohlhepp, Carl	Fort Yates, N. Dak.	Oct. 27, 1900
91	Kolster, Daniel A. H.	San Luis, Cuba	Apr. 2, 1900
92	Kotwall, John	Iloilo, P. I.	Nov. 2, 1899
93	Kuhlman, William R.	Tacloban, Leyte, P. I.	Nov. 17, 1900
94	Laakowski, Hugo	Presidio of San Francisco, Cal.	Sept. 28, 1900
95	Laufer, George	Fort Schnyler, N. Y.	Dec. 4, 1900
96	Lawrence, Bradley R.	Fort Clark, Tex.	Apr. 26, 1901
97	Lear, Edwin E.	Zamboanga, P. I.	Jan. 15, 1900
98	Lehman, Frank B.	West Point, N. Y.	Mar. 7, 1901
99	Lemmer, Louis	Plattsburg Barracks, N. Y.	Aug. 16, 1900
100	Loewidt, M. J.	Lucena, P. I.	Sept. 24, 1900
101	Luttge, August	Fort Porter, N. Y.	May 31, 1901
102	McAney, James	Sick in hospital, Manila, P. I.	
103	McCarthy, John	Holguin, Cuba	July 30, 1899
104	McIntosh, Frank C.	Fort McHenry, Md.	Jan. 31, 1899
105	McLees, Paul	Fort St. Michael, Alaska	Sept. 22, 1900
106	McMahon, John	Presidio of San Francisco, Cal.	Feb. 20, 1901
107	McManus, Patrick J.	Fort Niagara, N. Y.	Oct. 8, 1899
108	McVean, Charles C.	Rowell Barracks, Cuba	Feb. 18, 1901
109	Machle, Jerry B.	Columbus Barracks, Ohio	Nov. 26, 1899
110	Magen, Max	Dagupan, P. I.	June 1, 1901
111	Manske, William	Presidio of San Francisco, Cal.	Jan. 18, 1901
112	Maxson, Llewellyn M.	Manila, P. I.	Nov. 16, 1900
113	Merrill, Andrew J.	Transport Aztec	May 16, 1901
114	Miller, Daniel E.	Transport Warren	Apr. 4, 1901
115	Mills, Milton A.	Fort Dade, Fla.	June 9, 1900
116	Moberg, Charles A.	Fort Preble, Me.	Nov. 28, 1899
117	Morgan, Willis E.	Alcatraz Island, California	June 4, 1901
118	Morrison, W. D.	Vigan, P. I.	Jan. 10, 1900
119	Morrow, James A.	Fort Valdez, Alaska	Mar. 23, 1900
120	Muller, Richard	Fort Adams, R. I.	Dec. 7, 1899
121	Murazsko, Felix	San Francisco, Cal.	June 21, 1901
122	Murray, Michael E.	Fort Hamilton, N. Y.	Feb. 27, 1900
123	Nelson, Alexander	Manila, P. I.	Nov. 5, 1900
124	Nieman, August	Key West Barracks, Fla.	Feb. 27, 1899
125	O'Keefe, John J.	Fort Riley, Kans.	Apr. 16, 1900
126	O'Reilly, Garret	Manila, P. I.	June 28, 1901
127	Pearson, Charles M.	do	May 31, 1901
128	Peterson, Peter	Fort Grant, Ariz.	Apr. 28, 1900
129	Pollard, Samuel M.	Boac, P. I.	June 19, 1901
130	Powers, James	Santiago, Cuba	June 30, 1900
131	Pulsifer, George	Fort Leavenworth, Kans.	Aug. 1, 1899
132	Raik, Oscar	Fort Bliss, Tex.	Feb. 18, 1900
133	Redling, Charlie	Manila, P. I.	June 5, 1901
134	Reese, William W.	San Fernando, P. I.	Apr. 22, 1901
135	Reuter, William	Transport Thomas	Dec. 4, 1900
136	Riepe, Max E.	Awaiting station	June 30, 1901
137	Robinson, Thomas	Nueva Caceres, P. I.	May 10, 1901
138	Rohde, Ferdinand	San Juan, Porto Rico	June 20, 1901
139	Roos, August J.	Alcatraz Island, Cal.	May 18, 1901
140	Rose, Franklin	Fort Monroe, Va.	Nov. 24, 1900
141	Ross, Edward	Jefferson Barracks, Mo.	June 5, 1901
142	Rumpff, Richard F.	Fort Trumbull, Conn.	Oct. 27, 1899
143	Ryan, Andrew	San Diego Barracks, Cal.	July 21, 1899
144	Ryan, John L.	Columbus Barracks, Cuba	Sept. 25, 1900
145	Salter, John	Fort Caswell, N. C.	May 1, 1900

Roster of post commissary sergeants June 30, 1901—Continued.

	Name.	Station.	Assigned to present station.
146	Sanders, Charles.....	Habana, Cuba.....	Feb. 5, 1900
147	Sandstrom, Charles.....	Balayan, P. I.....	June 29, 1901
148	Schaupp, Gustav.....	Aparri, P. I.....	May 17, 1901
149	Schiller, Frederick.....	Manila, P. I.....	Apr. 30, 1900
150	Schiller, Julius.....	Fort Totten, Willets Point, N. Y.....	Apr. 6, 1899
151	Scott, Richard M.....	Fort Stevens, Oreg.....	May 18, 1901
152	Shaffer, Samuel W.....	Fort Wright, Wash.....	May 28, 1901
153	Simesen, Charles W.....	Fort McDowell, Cal.....	June 4, 1901
154	Simon, Henry C.....	Awaiting transportation to Fort Egbert, Alaska.....	
155	Smart, Alexander.....	Transport Lawton.....	May 31, 1900
156	Smith, Byron K.....	Jackson Barracks, La.....	Aug. 21, 1900
157	Smith, Louis W.....	Fort Egbert, Alaska.....	Aug. 6, 1899
158	Spang, Frank.....	Pekin, China.....	Aug. 2, 1900
159	Steiner, Emil H.....	Fort Walla Walla, Wash.....	Mar. 14, 1900
160	Stephan, Charles.....	Fort McIntosh, Tex.....	June 3, 1901
161	Stephenson, Frank.....	Washington Barracks, D. C.....	Feb. 10, 1900
162	Stubley, John W.....	Fort Gibbon, Alaska.....	June 25, 1900
163	Summerlin, John D.....	Fort Strong, Mass.....	Nov. 24, 1900
164	Tabor, William A.....	Iloilo, P. I.....	Dec. 26, 1899
165	Tarbert, Robert A.....	Transport Buford.....	Oct. 18, 1900
166	Thompson, Joseph.....	Fort Fremont, S. C.....	Aug. 18, 1900
167	Thompson, Karl J.....	Transport Rosecrans.....	May 18, 1900
168	Titus, Charles W.....	Pasa Caballos, Cuba.....	June 28, 1901
169	Tobin, William J.....	Fort Reno, Okla.....	Oct. 5, 1900
170	Turner, John M.....	Fort Myer, Va.....	Dec. 2, 1899
171	Vaughn, Charles S.....	Fort Sam Houston, Tex.....	June 6, 1901
172	Wagner, Frederick.....	Fort Du Pont, Del.....	Mar. 23, 1901
173	Wallenstein, Andrew.....	Fort Mason, Cal.....	Sept. 14, 1900
174	Walser, John C.....	Honolulu, H. I.....	Jan. 8, 1901
175	Weber, Anton.....	Iloilo, P. I.....	May 13, 1901
176	Weege, Richard.....	Naic, P. I.....	Mar. 26, 1901
177	Wentzel, George.....	Transport Sheridan.....	Oct. 23, 1900
178	Wikander, John.....	General hospital, Presidio, San Francisco, Cal.....	Mar. 19, 1901
179	Wilson, John.....	Fort Hancock, N. J.....	Apr. 24, 1900
180	Wilson, John B.....	Fort Harrison, Mont.....	July 21, 1900
181	Wilson, John E.....	Presidio of San Francisco, Cal.....	Jan. 10, 1901
182	Wilson, Rene.....	Fort Brady, Mich.....	Nov. 5, 1900
183	Wood, Arthur G.....	Fort Logan, Colo.....	Sept. 29, 1900
184	Woods, James F.....	Fort Bayard, N. Mex.....	Sept. 21, 1900
185	Young, Charles.....	Borongon, Samar, P. I.....	Dec. 11, 1900
186	Ziesing, Joseph.....	Fort Barrancas, Fla.....	Aug. 10, 1900
187	Zimmermann, Anton.....	Transport Pakling.....	June 4, 1901
188	Zimmermann, Charles A.....	Fort Thomas, Ky.....	June 30, 1900
189	Zimmerman, C. F. B.....	Boise Barracks, Idaho.....	Dec. 10, 1900

APPENDIX IV.

EMERGENCY RATION FOR THE USE OF THE ARMY.

WAR DEPARTMENT, *Washington, D. C., January 29, 1901.*

ADJUTANT-GENERAL UNITED STATES ARMY.

SIR: I have the honor to forward herewith proceedings of a board of officers convened to report upon emergency ration for use in the Army.

Briefly, the board met and proceeded to the duty required of it. It announced that a military emergency ration should be the smallest nutritive equivalent which would maintain a soldier for one day without serious impairment of vigor and with the repetition of the same ration for a period not exceeding four days. The objective of its construction should be the largest food value in the smallest weight and bulk.

First. The components of the ration will be selected with reference to wholesomeness and proper nutritive value and to the portability of the ration as a whole.

Second. Acceptability as to taste.

Third. Keeping qualities.

Fourth. Weight of each ration and the kind, size, and form of package in which put up for convenience of use and of carriage on person.

Fifth. Direction for use of soldier.

Sixth. Part of the ration should consist of some cooked dry preparation which can be quickly made into a hot soup, stew, or other hot fluid dish whenever it is practicable; and when a fire is not practicable such article can be eaten cold, either just as it is or mixed with water. (See p. 488.)

The board occupied itself in examining and testing various articles of food supposed to be suitable for such a ration (488 to 491). Not one of the three complete rations submitted to the board fulfilled the requirements of the emergency ration (488 to 491). An emergency ration is defined to be the absolute amount of alimentary principles of food required, not only to preserve life, but to keep up full muscular strength and endurance for a number of days (492). Are divided into protein, fat, and carbohydrates (492). Standard tables of dietaries (492). Protein for emergency ration at full amount of standard diet, life and vigor may be preserved for many days. Fat and carbohydrates interchangeable. Fat has double calorific value, but is difficult to digest and causes intestinal trouble. Carbohydrates easily digested and wholesome (493). Tabulation of nutrients (494). Animal food contains more protein than vegetable and is more completely digested. On account of health these should be selected (494). The board selects evaporated beef for protein (494); kiln-dried wheat for carbohydrates (494 and 495); chocolate for beverage, and why (494).

"Pinole" was prepared from various grains. The combination of wheat and beef gives a ration composed of bread and meat, the ordinary food of civilized man. The following proportions were adopted: Four ounces evaporated beef, 8 ounces of parched wheat, seasoned with 1 ounce of salt and small quantity of pepper, for the bread and meat component; 2 ounces of chocolate combined with 2 ounces of sugar for the remaining component.

The calorific value of the ration is 1,955 calories, and is easily increased by adding fat (495). The complete ration has less than 6 per cent of water, and occupies but 25 cubic inches. An equal weight of hard bread occupies 72 cubic inches (495). Direction for use and size of package. (496.)

Board was authorized to manufacture 2,000 of its rations and directed to proceed to Fort Reno and from there to make marches with troops living exclusively on the ration; also to test in same manner standard emergency ration and a ration prepared by the Armour Company, of Chicago (497, 498). Rules for marches and tests (501). Trial on No. 1 (the board's ration) (502 to 508). At end of trial every member of command testified to being in as good condition as if ordinary rations had been used. The net loss in weight of the 34 men subsisting on the ration during the trial was 7½ pounds. The result of this trial was exceedingly favorable to ration No. 1. Trial

on No. 2 (standard emergency ration) (508 to 514). At termination of trial a majority of the men were complaining of hunger and weakness. The 28 men subsisting on this ration lost 144 pounds during the trial. This could hardly be called an excessive loss, provided the men's health and strength had been kept up, but the loss of strength presents a very grave objection to the use of this ration for more than a day or so at a time. In the opinion of the board five days is the extreme limit of time it could safely be employed for the subsistence of troops entirely unprovided with other food with which to eke it out. Trial on No. 3 (the Chicago ration) (514 to 520). During this trial nearly everyone subsisting on the ration suffered excessively from hunger, and a number of the men became so demoralized through this cause as to make no effort to observe the order to eat no other food than the ration. Some of the men were reduced to a pitiable state of weakness, and eight of them were put on full rations before the trial was concluded. This ration is unsuitable for its purpose in any case, as it is only to be eaten after further cooking, while one of the requisites of an emergency ration is that it can be eaten dry as it comes from the can.

The result of these three trials having demonstrated to the satisfaction of the board that No. 1 best fulfilled the requisite of an emergency ration, arrangements were made for a fourth or final trial.

The detachments from Forts Sill and Reno united at Anadarko, and command was put on ration No. 1 (520 to 527). Before starting out the object of the trial was carefully explained to the men, and they were asked to report to the commanding officer in case they felt at any time that the ration was insufficient, being told that in such case they would be put on ordinary rations.

This trial was simply to ascertain in what condition for service a cavalry command would be after subsisting on it during a five-days' march or campaign.

The route was so laid as to make each day's march approximately 20 miles, and instead of making camp before the midday meal, care was taken to halt daily about noon for luncheon, which for this meal consisted of the ration dry as it came from the can, washed down by water from the canteen. Camp was made some time during the afternoon, all the necessary work being performed before the evening meal was served. The actual loss of weight of the 56 men subsisting on the ration was 6 pounds. The result of this trial was to confirm the members of the board in their favorable opinion of No. 1 ration. At no time during the trip was there the slightest indication in the appearance of any man that he was suffering from hunger or weakness, and no men were treated for illness that could be attributed to the ration.

This was a much severer test than any of the rations had been subjected to during the first series of trials, and the results were so very favorable that the board feels warranted in asserting that any command can go into a campaign and subsist exclusively on this ration for ten or more days at a time with the absolute assurance of being fit for service at all times.

The results of trials summarized (527, 528). It is not considered necessary in this summary to give the favorable individual statements, and mention is made of the various unfavorable ones only to show how trifling they are when regarded as affecting the efficiency of the command.

In neither of the trials of No. 1 was there the slightest evidence of suffering or weakness in either face or bearing of the men composing the detachments, but, on the contrary, every man looked as fresh and strong at the end as at the beginning of the trial.

In the opinion of the board the ration formulated by it fulfills all the requirements of an emergency ration. The package is of convenient form for easy carriage on the person and possesses a minimum of bulk, measuring only 26 cubic inches. The ration is simple in composition and preparation, acceptable as to taste, easy of digestion, possesses good keeping qualities, is capable of quick preparation, requiring no special skill or appliances, and when fire is not available can be eaten without any preparation whatever.

The practical tests have shown that it is capable of keeping up the full muscular strength and endurance of the soldier for a number of days with no suffering from hunger and but a trifling loss in weight.

The board therefore recommended this ration for adoption and issue as the United States Army emergency ration.

Very respectfully, your obedient servant,

S. W. FOUNTAIN,
Captain, Eighth Cavalry.

REPORT OF THE SECRETARY OF WAR.

[First indorsement.]

WAR DEPARTMENT, ADJUTANT-GENERAL'S OFFICE,
Washington, February 1, 1901.

Respectfully referred to the Commissary-General of Subsistence, U. S. A., for remark.

By order of the Secretary of War:

GEO. ANDREWS,
Assistant Adjutant-General.

[Second indorsement.]

OFFICE COMMISSARY-GENERAL OF SUBSISTENCE,
Washington, February 7, 1901.

Respectfully returned to the Adjutant-General of the Army.

The board made a long and exhaustive study of the matter of the emergency ration. The letter formulated by it and sent to manufacturers defines the emergency ration and sets forth the requirements of same, and is deemed to be entirely correct. It determined upon a very proper nutritive value which such a ration should possess. The line of reasoning to arrive at such determination is entirely accurate and founded upon the experience of the best and most eminent scientists both in this country and abroad. It has taken into consideration the adoption of such food products as would provide a proper nutritive value required for such a ration. After considering the various preparations which had been submitted to it, the board finally decided upon three very simple ingredients—hulled wheat, desiccated beef, and sweet chocolate, the latter being a most desirable article in tropical climates where sweets are required—the components of which form a ration possessing proper nutritive value.

These articles of food are well known, are very simple, and the preparation of a ration from them is one that can be undertaken not by one but by many large firms throughout the country.

With the consent of the Secretary of War the board made a trial of the ration which had been recommended by it and prepared under its supervision, and such a trial has been eminently satisfactory, the report indicating that all the men who had subsisted on the ration were entirely satisfied with it. The report also shows that there were no ill effects upon health or impairment of strength of those using the ration. Every member of the party which tried the ration has expressed himself as well pleased with it, and from a preliminary report of the board the Secretary of War has authorized the manufacture and purchase of 50,000 of these rations to be sent to the Philippines.

While these rations have satisfied the board, as well as the troops that tried them, still I think it best, before taking further action, that the 50,000 rations purchased for Manila receive another practical test there which should be exhaustive.

J. F. WESTON,
Commissary-General of Subsistence.

[Third indorsement.]

ADJUTANT-GENERAL'S OFFICE,
Washington, February 9, 1901.

Respectfully submitted to the Lieutenant-General Commanding the Army.

GEO. ANDREWS,
Assistant Adjutant-General.

[Fourth indorsement.]

HEADQUARTERS OF THE ARMY,
Washington, March 9, 1901.

Before further action the Lieutenant-General concurs with the Commissary-General that the 50,000 rations purchased for Manila receive another practical test.

THOMAS WARD,
Assistant Adjutant-General.

[Fifth indorsement.]

WAR DEPARTMENT, ADJUTANT-GENERAL'S OFFICE,
Washington, March 12, 1901.

Respectfully returned to the Commissary-General of Subsistence, United States Army, for file in his office.

By order of the Secretary of War:

GEO. ANDREWS,
Assistant Adjutant-General.

PROCEEDINGS OF A BOARD OF OFFICERS CONVENED AT WASHINGTON, D. C., PURSUANT TO THE FOLLOWING ORDER, LETTER, AND INDORSEMENT:

SPECIAL ORDERS, }
No. 295.

HEADQUARTERS OF THE ARMY,
ADJUTANT-GENERAL'S OFFICE,
Washington, December 20, 1899.

[Extract.]

* * * * *

19. By direction of the Secretary of War, a board of officers to consist of Lieut. Col. Charles A. Dempsey, First U. S. Infantry; Capt. Samuel W. Fountain, Eighth U. S. Cavalry; Capt. Fred W. Foster, Fifth U. S. Cavalry, is appointed to meet at the War Department, Washington, D. C., at 10 a. m., December 22, 1899, or as soon thereafter as practicable, for the purpose of considering and reporting upon the matter of the composition of the ration for the use of troops in tropical climates. The junior member of the board will act as recorder.

The board is authorized to call upon the Surgeon-General and the Commissary-General of Subsistence for such data and information as may be necessary.

Upon the final adjournment of the board the members thereof will return to their respective places of receipt by them of this order.

The travel enjoined is necessary for the public service.

* * * * *

By command of Major-General Miles:

H. C. CORBIN, *Adjutant-General.*

WAR DEPARTMENT,
OFFICE COMMISSARY-GENERAL OF SUBSISTENCE.

Washington, January 5, 1900.

THE ADJUTANT-GENERAL OF THE ARMY.

SIR: I have the honor to state that by General Orders, No. 49, Adjutant-General's Office, December 5, 1896, an emergency ration was established by direction of the President, under authority vested in him by section 1146, Revised Statutes. By Special Orders, No. 17, Headquarters of the Army, January 21, 1899, a board of officers was convened to examine, test, and report upon the various emergency rations as to their adaptability for use in the Army, and to compare the present authorized emergency ration with those that may be submitted to the board. The board recommended that the emergency ration established by above-mentioned general orders be continued, and that no modification of the same be made. In my opinion the present emergency ration is one in name only, in that it fails to meet the essential military requirements for an emergency ration.

First. Such a ration should be small in volume and of a style of package easily transported in the pockets or haversacks of the men.

Second. Articles composing this ration should be capable of being eaten without preparation necessitating the use of fire.

Attention is invited to the fact that the emergency ration this department is now supplying to the troops in the field is not the one described in the general orders previously referred to, but is a preparation known as the standard emergency ration.

Because of this it is suggested that this matter be brought to the attention of the board, now in session here, with a view to establishing a ration, so that this department may buy what is desired rather than what is not.

If the standard emergency ration answers the purpose, let it be established; if not that, then something else.

Very respectfully,

J. F. WESTON,
Acting Commissary-General of Subsistence.

[First indorsement.]

WAR DEPARTMENT, ADJUTANT-GENERAL'S OFFICE,
Washington, January 9, 1900.

Respectfully referred to Lieut. Col. Charles A. Dempsey, First Infantry, president board of officers appointed by Special Orders, No. 295, paragraph 19, December 20, 1899, from this office.

By order of the Secretary of War:

JOHN A. JOHNSTON,
Assistant Adjutant-General.

WASHINGTON, D. C., August —, 1900.

On receipt of the communication of the Acting Commissary-General of Subsistence the board at once took up the subject of the emergency ration. After full discussion and a careful examination of all the available literature on the subject, including the proceedings of the various boards of officers published as an appendix to the annual report of the Commissary-General of Subsistence for the fiscal year ending June 30, 1896, the report of a practical test of the use of the authorized emergency ration by United States troops in active service, embraced in the annual report of the Surgeon-General for the fiscal year ending June 30, 1897, and the proceedings of board of survey convened by Special Orders, No. 17, Headquarters of the Army, Adjutant-General's Office, January 21, 1899, the board prepared and sent the following circular letter to various manufacturers of and dealers in food products with a view of eliciting any information they might possess on the subject, and also to stimulate them to independent investigation and experiment:

WAR DEPARTMENT,

Washington, D. C., January 24, 1900.

GENTLEMEN: The board of officers convened by Special Orders, No. 295, Adjutant-General's Office, series 1899, to report upon ration for use of troops serving in the Tropics, has been further ordered to investigate and report upon a suitable ration for use of troops under emergency. A military emergency ration should be the smallest nutritive equivalent which would maintain a soldier for one day without serious impairment of vigor, and with the repetition of the same ration for a period of not exceeding four days.

The emergency ration is not intended for continuous use. It is to be used only occasionally and for short periods. The necessity for having in it the exact proportion of the proximate principles required by the system is not imperative. The objective in its construction should be the largest food value in the smallest weight and bulk.

First. The components of the ration will be selected with reference to wholesomeness and proper nutritive values and to the portability of the ration as a whole.

Second. Acceptability as to taste.

Third. Keeping qualities.

Fourth. Weight of each ration and the kind, size, and form of package in which put up for convenience of use and of carriage on the person.

Fifth. "Directions for use of soldier."

Sixth. "Part of the ration should consist of some cooked dry preparation which can be quickly made into a hot soup, stew, or other hot fluid dish whenever it is practicable, and when a fire is not practicable such an article can be eaten cold, either just as it is or mixed with water."

Fat has an available energy of more than twice that of an equal weight of the proteids and carbohydrates. The amount of fat assimilated by the system varies, not only with the conditions as to heat or cold and rest or labor, but also with the quantity of carbohydrates in the diet. If the carbohydrates are not to be had, fat in excess of that ordinarily assimilated will be utilized by the system. Any deficiency in the proteids and starches may be offset by the higher calorific value of the fatty element. The fat, however, can not take the place of the proteid principles in the repair of the muscular system.

A standard dietary for hard work should have about 4.2 ounces of the proteids, equivalent to about 300 grains of nitrogen, for the average nitrogenous waste of the system amounts to about that quantity.

The above information is respectfully furnished to indicate the lines upon which the board will investigate, and its preferences as to a suitable emergency ration which of itself would be ample to sustain life without serious impairment of vigor for several days, and, when supplemented with the hard bread that is generally available for issue, would enable the soldier to continue the expenditure of the same energy for a longer period.

You are requested to bring before the board samples of such concentrated foods as may be in your line and such information pertaining thereto as you may deem of service to the board.

Respectfully,

F. W. FOSTER,

Captain, Fifth Cavalry, Recorder.

The board occupied itself for some time in examining and testing various articles of food supposed to be more or less suitable for the purposes of an emergency ration and in holding interviews and conducting experiments with the parties presenting or representing these articles.

G. L. Schiesser & Co., No. 25 Third avenue, New York, submitted samples of "zwieback" or "Swiss army biscuit." This is apparently made by taking a loaf of bread of minute air spaces, cutting it into slices about five-eighths of an inch thick. These are then rebaked until they resemble very hard dry toast, and evidently contain very little water. The analysis given by Messrs. Schiesser & Co. was as follows: Water, 6.9 per cent; protein, 11.75 per cent; fat, 0.10 per cent; carbohydrates, 78.63 per cent; salts, 2.56 per cent. A later letter received from them stated that they had succeeded in increasing the protein to 17 per cent and could increase it to 20 per cent if desired. The second analysis was as follows: Water, 6.9 per cent; protein, 17 per cent; carbohydrates, 73 per cent; fat, 5 per cent; salts, 2.6 per cent. Zwieback as thus constituted might form a very valuable substitute for the ordinary hard bread, especially when issued in connection with bacon, a meat which is notably deficient in protein, but is inadmissible as an emergency ration for the reason that to give the amount of protein called for by the circular letter issued by the board would require nearly 2½ pounds, while 1 pound of zwieback alone occupies a space of 35 cubic inches.

Nelson Morris & Co., Chicago, Ill., submitted a ration consisting of a meat sausage put up in tin cans and weighing 2½ pounds per ration. This ration is said to consist of meat and vegetables. Its weight and bulk at once put it out of the category of emergency rations. It might form a pleasant variety to the meats ordinarily issued as part of the travel ration.

Libby, McNeil & Libby, Chicago, submitted samples of corned beef hash, as did also the agent of the firm that manufactures "Mother Fuller's Corn Beef Hash." The same objection exists to both these compounds as part of an emergency ration as in the last case, but either would answer very well as the meat component of the travel ration. They seemed equally good when eaten cold, but when heated that put up by Libby, McNeil & Libby was much more palatable.

Mr. J. Winslow Jones, of Patuxent, Md., submitted samples of a so-called emergency ration consisting of a moist preparation of meat, corn, and other vegetables put up in tin cans. This was not at all adapted to its purpose and calls for no further attention.

Mr. Louis Weidner, No. 587 Eddy street, Chicago, Ill., submitted a compound pea soup in parchment rolls. This seems to be practically the same as Knorr's pea soup, a German preparation said to have been used extensively in the German army with satisfactory results. This was tested by the board and gave a fairly palatable soup. Although this preparation is not by itself considered sufficiently nutritious to constitute an emergency ration, it might be utilized either as part of such a ration or as an easily transported soup to be furnished in connection with other rations. Mr. Weidner also submitted a liquid preparation known as "Wahl's bouillon stock," with testimonials and recommendations. No liquid preparation can possibly answer as an emergency ration. The water only adds to the weight and bulk and has no nutritive value.

Swift & Co., Chicago, Ill., submitted samples of beef extract. Beef extract possesses little or no nourishing value. Its value is as a stimulant or flavoring agent only.

Wilkinson, Gaddis & Co., New York, submitted "Choco-Lactine." This is a very light and flocculent preparation of chocolate, milk, and sugar. It is furnished in glass jars, and as it is very easily dissolved in water or milk might be a convenient article for ordinary use, but as a component of an emergency ration its bulk condemns it at once.

The "Bovril Limited" Company, Montreal, Canada, submitted samples of five different emergency rations, called "ration cartridges," put up in neat tin cans at prices ranging from \$3.90 to \$5 per dozen, and weighing, can included, from 10 to 14 ounces per ration. They are said to be composed of meat extractive, albuminoids, vegetables, etc., and several of them have, in addition, a chocolate component for use as a beverage. On trial they were found to be very palatable eaten just as they came from the can. They contained quite a large proportion of moisture, and were not sufficient either in weight or nutritive power to supply all the nourishment required for a ration, but would require to be supplemented by a certain amount of bread or other food.

The Armour Packing Company, Kansas City, Mo., submitted samples of fried bacon put up in air-tight cans. This bacon can be put up in any shaped can desired and any size from 4 ounces up. Owing to the fact that a heavy tin is required to stand the pressure due to the exhaustion of the air from these cans, it would not be desirable to pack in smaller cans than 4 ounces. A can holding 4 ounces of bacon weighs, as a whole, 6 ounces. This bacon was found very appetizing, both as to appearance and taste. It was very palatable, both cold as it came from the can and when heated

in a frying pan. Raw bacon contains 20 per cent water, while the fried has only 4.6 per cent, so that bacon thus prepared weighs 15.4 per cent less than canned raw bacon of equal nutritive value, and is fully as palatable as it comes from the can as is the latter after it has been cooked. The keeping qualities of this product are guaranteed by the packers, and the board regards it as a valuable auxiliary to any ration when cooking facilities are not available. It would seem to be a particularly desirable meat component for the travel ration.

The Jersey City Milling Company, Jersey City, N. J., submitted a "cooked wheat, kiln dried, with the outer bran removed." The manufacturers claim that "It is as valuable and condensed a food as can safely be fed to man; better than rice, because it is glutinous; better than beans, which all stomachs imperfectly digest. It will support life indefinitely and without any other food, and leave the system in perfect condition." Examination and analysis indicate that although not capable alone of fulfilling all the requisites of an emergency ration, this product possesses very great advantages as the bread or cereal component of such a ration. In the first place, it is of the same composition as wheat flour. In the process of manufacture it has been freed from the bran which contains all that part of the grain not easily digested. It has been thoroughly cooked, and then freed from its excess of water by kiln drying. It is fully as digestible and contains all the nutritive qualities of wheat bread in one-fourth the bulk, and if this product can be so prepared as to fulfill the sixth requirement of the emergency ration it is undoubtedly the best article yet brought to the notice of the board as the bread component.

Pea and bean meal, which have been recommended for this purpose, have the advantage of containing a high proportion of protein, but with the disadvantage of being highly indigestible to a great many persons.

A sample of evaporated fresh beef was procured by Col. C. A. Woodruff, A. C. G. S., and submitted to the board. The method of preparation is as follows: Fresh beef is cut into small pieces, freed from all visible fat, sinew, etc., and then evaporated until nearly all its water is driven off. The product is a hard, dry material, similar to jerked beef, but in small kernel-like pieces, containing but about 8 per cent of water in lieu of the 73 per cent of the fresh product, and keeping indefinitely when not exposed to moisture. A sample exposed to the air for several months is as sweet and good as when first procured. Fresh beef—miscellaneous cuts—free from visible fat has nutritive value compared with the evaporated product, as follows:

	Water.	Protein.	Fat.	Calories.
	Per cent.	Per cent.	Per cent.	
Fresh beef	73.8	22.4	2.9	540
Evaporated beef	8.23	75.31	13.67	1,974

Thus 1 pound evaporated beef is nearly equal in nutritive value to 4 pounds of fresh lean beef free from bone.

Beef thus prepared is not only extremely nutritious, but is in condition to be easily and thoroughly digested. Lean beef has been found to be digested even more readily when taken raw than cooked, provided it is properly masticated. So that by grinding evaporated beef to a fine powder, which is readily done, it is not only in condition for indefinite preservation, but also in shape for immediate and complete assimilation when taken in the human system. In this condition it has a pleasant, meaty flavor, but a very slight one, and in combination with any article of decided flavor would probably only be recognized by the increased richness of the compound.

Only three of the compounds submitted to the board, and claiming to embody in themselves the constituents of a complete emergency ration, were worthy of consideration as such:

1. Those of the Bovril Company above referred to.
2. The standard emergency ration submitted by Mr. I. W. England on behalf of the American Compressed Food Company, of Passaic, N. J. This ration is contained in a sealed can measuring $4\frac{1}{2}$ by 3 by $2\frac{1}{8}$ inches, and weighs as a whole 20 ounces. The contents consist of a cake of compressed tea, and three cakes of a grayish material, the three together weighing about 16 ounces. This ration is intended for the support of one man for a day. These cakes may be eaten raw or cooked. The manufacturers claim that the cakes consist of $3\frac{1}{4}$ ounces of fat bacon, 4 ounces of pea meal, $4\frac{1}{2}$ ounces of hard bread, $3\frac{1}{2}$ ounces of evaporated beef, one-fourth ounce each of evaporated potatoes and onions, and are flavored with salt, pepper, and celery seed.

Analysis performed in the laboratories of the Agricultural Department and the Surgeon-General's Office, respectively, give the following results:

	Protein.	Fat.	Carbohy- drates.	Calories.
	<i>Per cent.</i>	<i>Per cent.</i>	<i>Per cent.</i>	
Agricultural Department	32.75	9.27	35.89	2,166
Medical Department	29.4	8.32	41.95	2,129

The value determined by combining the values of the various constituents was as follows:

Protein, 121.61 grams; fat, 94.23 grams; carbohydrates, 158.85 grams; calories, 2,011. These values practically agree with the claims of the manufacturers.

These rations have been examined during the past two years by a number of officers, and a number of trials have been made as to their suitability for the purposes for which manufactured. The testimonials and reports first submitted to the board were very strongly in favor of this ration. The first sample opened by the board proved to be rancid, and as mixtures of fat and starches are prone to become rancid, it would appear that there is at least a doubt whether this ration would keep sweet and good under all conditions of service. On March 24, 1900, an extract from a report of Maj. William D. Beach, inspector-general, U. S. V., made February 2, 1900, in connection with his work as inspector-general of the First division, under General Lawton in the Philippines, was furnished the board, in which this ration was referred to as follows: "The emergency ration was used during six consecutive days by myself and my detachment, but fortunately we had a little coffee, bacon, and sugar with which to eke out, so that it did not grow very distasteful. As a rule the men dislike it, but for the purpose intended it is excellent. About 10 per cent of what we carried was spoiled by reason of the cans being poorly soldered, although the fact of its being bad was not discovered until the cans were opened."

As a large quantity of these rations had been sent to the Philippines, the following cablegram was sent at the request of the board:

ADJUTANT-GENERAL'S OFFICE,
Washington, March 30, 1900.

OTIS, Manila.

Secretary of War directs report on standard emergency ration. Have oldest in storehouse examined as to appearance and tightness of cans. Open number; give condition of contents and percentage spoiled. Have company commanders who have used it report number consecutive days this ration was used exclusively, and results; wholesomeness, palatability, sustaining, and hunger-satisfying power; keeping qualities.

CORBIN.

On June 14, 1900, the report asked for was referred to the board by indorsement from the office of the Commissary-General of Subsistence, with request that the report be returned to his office when no longer needed.

The report is rather incomplete, but the general tenor is to the effect, in a majority of cases, when the opinion of the men who actually used the ration was obtained, that it does not answer the purpose. In a number of instances a considerable number of men eating it were made sick, which would indicate that it was either spoiled or else was more or less indigestible, both very grave faults in a ration of this character.

On the whole, the board is unable to recommend this ration as a suitable emergency ration.

3. The National Milling and Evaporating Company, of East Tawas, Mich., submitted a ration contained in an oval-shaped tin can. The contents consist of a cake of compressed tea and three cakes of a cream-colored material, the three together weighing 13½ ounces. This ration is intended for the subsistence of one man for a day. The cakes may be eaten either raw or cooked. The manufacturers claim that the cakes consist of beef, ham, bean flour, pea flour, onions, potatoes, carrots, and turnips, but the particular proportion of the various ingredients is not given.

An analysis performed in the laboratory of the Agricultural Department gave the following results:

Protein, 44.6 per cent; fat, 9.3 per cent; carbohydrates, 31.63 per cent; calories per ration, 1,523.

This ration is pleasant to the taste either raw or cooked into soup, but the nutritive value is too low to render it suitable for its purpose.

Neither of these three complete rations, therefore, fulfilled the requirements of an emergency ration.

The board therefore took up the consideration of the general subjects of emergency rations and their requisites, as outlined in circular letter of January 24.

An emergency ration might be defined as a reserve supply of food to be carried by the soldier in addition to his ordinary rations, and only to be used when the latter are exhausted; but when so used, to not only preserve his life, but to keep up his full muscular strength and endurance for the number of days for which such rations are carried. It should be selected with reference to its portability, which includes its weight, bulk, and form of package. It should be simple in composition and preparation, acceptable as to taste, easy of digestion, possess good keeping qualities, and capable of quick preparation requiring no special skill or appliances, and when fire is not available should be eatable without any preparation whatever. Simplicity of preparation is absolutely necessary, as ordinarily the only cooking utensils available will be the soldier's tin cup and meat-ration can. An emergency ration should, furthermore, be packed in such form that such portion of it as is necessary for one day can be used without disturbing the balance or affecting its keeping qualities. This can best be attained by combining all the parts of the ration in a sealed tin can, each can containing one ration only, and to be of such construction as to absolutely protect the contents from deterioration from any exterior influences whatever.

This ration should only be opened on the order of an officer or in extremity.

The board then took up the question of the absolute amount of the alimentary principles of food required to fulfill the above conditions. These alimentary principles or nutrients are divided into three general classes—protein, fat, and carbohydrates. Protein forms muscle, tendon, etc., and serves as fuel. Fat forms fatty tissue (not muscle) and serves as fuel. Carbohydrates are transformed into fat and serve as fuel.

The uses of food are: First, to form the materials of the body and repair its wastes; second, to yield energy in the form of heat and power. The nutrients act in different ways. The muscle and tendon former is the protein. The bodily machine is made of protein; that is to say, the blood, muscle, tendon, and bone all consist of or contain protein compounds. As the muscles and other tissues are used up in bodily activity, the same materials of the food are used for their repair.

The fuel formers are the fat and carbohydrates. This fuel may be either consumed at once or stored in the body in the shape of fatty tissue to be used when required.

The protein is utilized at once in forming muscle, etc., while the other nutrients may be and are partly stored up in the body in the shape of fat, ready to be drawn on as fuel when for any reason sufficient fat and carbohydrates are not supplied in the daily food.

In order to determine the amounts of these principles required for the diet of man under different conditions, we have recourse to the standard tables of dietaries as determined by the leading authorities on the subject. Among the most valuable and authoritative are those of Voit, Atwater, and Moleschott, which give the following as standard diets for the maintenance of health in a person of average height and weight with a moderate amount of work:

	Protein.	Fat.	Carbohydrates.	Calories.
	<i>Grams.</i>	<i>Grams.</i>	<i>Grams.</i>	
No. 1, Voit.....	118	56	500	3,050
No. 2, Atwater.....	125	125	450	3,500
No. 3, Moleschott.....	130	84	404	2,970

Although these authorities differ to some extent, it can safely be accepted that the maximum emergency ration would contain at least 118 grams of protein and possess a force value of about 3,000 calories. The minimum would be determined by Playfair's subsistence diet, or that needed to carry on the internal work of the human system with no exterior work whatever.

	Protein.	Fat.	Carbohydrates.	Calories.
	<i>Grams.</i>	<i>Grams.</i>	<i>Grams.</i>	
Playfair.....	56.6	14.2	340	1,758

The actual weight of the nutrients in the first or maximum diet will be about 22 ounces, while in the second it is but 14.5 ounces. The first weight is far above what can be allowed for an emergency ration, as in addition to this must be added the weight of the can and included water. The second weight would be admissible, but a ration so constituted will only maintain strength and weight in a state of absolute quietude.

The problem is, therefore, to make the weight of the proposed ration about equal to that of the subsistence diet, while at the same time keeping up the full muscle making and repairing power of the standard one. In this connection attention should be directed to the following dietaries, which were prepared for the express purpose of reducing weight without affecting muscular strength and vigor.

	Protein.	Fat.	Carbohy- drates.	Calories.
	Grams.	Grams.	Grams.	
Banting.....	171	3	73	1,085
Ebstein.....	102	85	47	1,400

In these dietaries with a total calorific value considerably below that of the bare subsistence diet the protein component is much increased, the difference being made up in the fuel-furnishing components. This gives us the key to the formation of a successful emergency ration. The nitrogenous principle or protein is absolutely essential in repairing the waste of muscle, and can be obtained only from the daily food. The carbonaceous elements furnish fuel for the operations of the body, and if sufficient is not supplied from the fat and carbohydrates of the daily food, the balance is drawn from the stored up fat of the body without any material discomfort or inconvenience. Thus by fixing the protein of the emergency ration at the full amount of the standard diet, and adding sufficient fat and carbohydrates to bring the calorific value up to or beyond that of the subsistence diet, life and vigor may be preserved for many days with full retention of strength on much less than the standard diet, but with a constant loss of weight. Any such loss of weight may easily be repaired by a full diet when the emergency is over. How much the fuel increments can be reduced is an extremely important point to be determined. The soldier must be prevented from experiencing any depression of spirit or marked feeling of hunger, and it is essential that the ration as finally compounded shall be capable of easy and perfect digestion.

Fats and carbohydrates are to a certain extent interchangeable in a dietary and both supply fuel. The calorific value of the fat is more than double that of the carbohydrates and from a chemical point of view, a ration composed exclusively of protein and fat might appear to be a very excellent and nutritious one. Fat, however, is extremely difficult of digestion when in a large proportion, and such a ration would be exceedingly dangerous to health, and almost sure to cause intestinal and stomach troubles. The carbohydrates are very digestible, and to insure healthfulness the ration should contain as large a proportion of these as possible.

The question is then resolved into constituting a ration composed of such ingredients as will give at least 118 grams protein and the largest possible amounts of fat and carbohydrates that can be combined to form a nourishing, easily digested food, with a calorific value equal to that of the subsistence diet, and at the same time to keep the weight and bulk within the smallest limits consistent with the above conditions.

The following tabulation gives the percentages of nutrients in various substances used as food, with their calorific value. These percentages were partly obtained from Bulletin No. 28, issued by the Department of Agriculture, and partly by actual analysis of materials used, performed in the laboratories of the Agricultural Department and Surgeon-General's Office. The properties of other foods were looked into, but it was finally determined that this list contained everything that was liable to be of service in the investigation and everything else was therefore excluded from consideration. Looking over this table those foods may readily be selected that will give relatively the largest supply of the nutrients required.

The edible portions of food include water, nutrients, and salts. The water included in the food is no more nutritious than any other water, and if it can be got rid of in the preparation of the food and replaced at the time it is to be consumed, a distinct gain will be made in the bulk and weight to be transported in the meantime. This is illustrated in the items of fresh and evaporated beef in the table below, where with exactly the same composition, except the proportion of water, the latter has nearly four times the nutriment of the former.

[Ounce 28.3 grams.]

	Protein.		Fat.		Carbohydrates.		Water, per cent.	Salt, per cent.	Calo- ries.
	Per cent.	Grams.	Per cent.	Grams.	Per cent.	Grams.			
Fresh beef.....	22.4	6.34	2.9	0.82			73.8	1.2	540
Evaporated beef.....	75.31	21.31	13.67	3.87			8.23	4.08	1,974
Bacon.....	10.5	2.97	64.8	18.34			20.2	5.1	2,930
Fried bacon, Armour.....	5.51	1.53	73.4	20.71			4.6	7.15	3,008
Rice.....	8	2.26	.3	.08	79	22.36	12.3	.4	1,630
Hard bread.....	11.1	3.14	5	1.42	74.2	21	8.7	1	1,800
Oatmeal.....	16.1	4.56	7.2	2.04	67.5	19.1	7.3	1.9	1,860
Wheat, cracked.....	11.1	3.14	1.7	.48	75.5	21.37	10.1	1.6	1,685
Corn, pop.....	10.7	3.03	5	1.42	78.7	22.28	4.3	1.3	1,875
Beans.....	22.5	6.48	1.8	.51	59.6	16.87	12.6	3.5	1,605
Pease.....	24.6	6.95	1	.28	62	17.55	9.5	2.9	1,655
Chocolate.....	12.9	3.65	48.7	13.78	30.3	8.57	5.9	2.2	2,860
Sugar.....					100	28.3			1,860
Wheat, parched.....	14.38	4.07	2.19	.62	75.78	21.45	5.73	1.92	1,766
Sweet corn, parched.....	12.19	3.45	7.37	2.09	73.09	20.68	5.33	2.02	1,894
Hulled wheat, cooked, kiln dried, parched.....	11.69	3.31	1.08	.31	79.68	22.46	6.21	1.73	1,743
Standard emergency ration. ¹	29.4	8.32	19.1	5.41	41.96	11.87	5.72	3.22	¹ 2,129
National Milling and Evap- orating Co.:.....	32.75	9.27	21.16	5.99	35.89	10.15	5.30	5.37	² 2,166
Rations No. 1.....	42.81	12.12	6.1	1.73	36.97	10.46	7.96	6.66	1,739
Rations No. 2.....	46.20	13.07	6.6	1.87	30.9	8.74	8.45	7.65	1,709
Rations No. 3.....	44.8	12.68	15.1	4.27	27.02	7.65	7.23	5.85	1,969

¹ Medical Department.² Agricultural Department.

1 gram protein gives 4.1 calories.

1 gram fat gives 9.3 calories.

1 gram carbohydrates gives 4.1 calories.

From this table it would appear that the protein can best be obtained from evaporated beef, beans, or pease.

Animal foods have an advantage over vegetable in that they contain more protein and that this protein is more digestible. The protein of our ordinary meats is readily and completely digested. The protein of vegetable foods is much less completely digested. Of that of beans and pease a third or more may escape digestion and thus afford no nourishment, and also give rise to intestinal trouble. The fats of both animal and vegetable foods are, as a rule, more or less indigestible. The carbohydrates which make up the largest part of vegetable foods are generally very digestible. Crude fiber is an exception, but the greater part of this is usually got rid of in the preparation of the food. Sugar is supposed to be completely digested.

The question of healthfulness is such a vital one in connection with an emergency ration that between different foods capable of supplying the required amount of nutriment those should always be selected which are most easily and thoroughly digested.

From these considerations we select unquestionably evaporated fresh beef as the main source of protein for the proposed ration. The table presents several sources of carbohydrates for our consideration. Hard bread, oatmeal, wheat, corn, rice, and sugar all contain large proportions of that component. Extensive experiments were made with each of these articles, with the result of finally narrowing the choice to one between wheat and corn, with the addition of as large a proportion of sugar as would be palatable and easily digested.

For a beverage chocolate was selected, as not only does it contain the same stimulating principle as tea and coffee, but the large quantity of fat and albuminoid substance makes it a very nourishing article of diet, and useful under circumstances of great exertion, furnishing a large amount of nourishment in small bulk.

We have thus theoretically the alimentary substances best suited for our emergency ration. They are practically water free, and if the ration can be so prepared as to be susceptible of easy reduction from its dry and preserved condition into a palatable form readily acted on by the digestive organs, and easily assimilated, the problem will be solved.

Any one who has traveled or campaigned in the southwestern parts of the United States has undoubtedly become acquainted with the "pinole" of the Indians and Mexicans. This consists of parched and ground grain, usually wheat or corn. The parching renders the grain tender, easily masticated, and digestible, without adding

to its bulk. When an Indian or Mexican starts on a journey he takes a bag of "pinole," a piece of "jerked beef," and a cake of "native sugar" as his sole provisions, and can travel for days perfectly independent of fire. Acting on the hint derived from the above practice, different grains were procured, parched and ground, and "pinole" of various kinds produced. It was found that by grinding the parched grain rather coarsely, and mixing the product with various proportions of evaporated ground beef and a sufficient amount of salt, a very palatable compound was produced. This was simply combining the Mexican's "pinole" and jerked beef in one article and thus making a combined food.

"Pinole" was now prepared from various grains, and various tests, both analytic and practical, made of the different products. Taking everything into consideration, the most satisfactory results were obtained from a hulled, cooked wheat prepared by the Jersey City Milling Company and previously described. This wheat as received was extremely hard and apparently very dry; nevertheless it contained a small amount of moisture, as in parching it lost about 6 per cent in weight. The parched product was very tender, having a pleasant odor and flavor, being in the last respect notably better than any other article experimented with. This material is in every respect the most satisfactory yet produced for the purpose. In the process of manufacture the indigestible part of the grain—the bran—is removed, thus assimilating it to the flour from which ordinary bread is made. The product is then thoroughly cooked, making it a perfect cereal food, only needing to be made tender and easily masticated. This is done by the parching, and the product is practically a water-free, easily digested food.

The combination with the powdered beef, therefore, gives us a ration composed of wheat bread and beef, the ordinary diet of civilized man, and one that nearly every stomach can readily and thoroughly digest.

Having determined that the ration should consist of parched wheat, evaporated beef, chocolate and sugar, various experiments were made to determine the most suitable proportions of the various ingredients. The following proved very satisfactory and was finally adopted: Four ounces evaporated beef, 8 ounces parched wheat, seasoned with one-quarter ounce salt, for the bread and meat component; 2 ounces chocolate, combined with 2 ounces sugar, for the remaining component. The food value of the ration thus constituted is as follows:

Ounces.	Rations.	Protein.	Fat.	Carbo- hydrates.	Calories.
4	Evaporated beef.....	85.24	15.48	.....	498
8	Parched wheat.....	26.48	2.48	180.40	871
2	Chocolate.....	7.20	27.56	17.14	358
2	Sugar.....	.....	.....	56.60	233
	Total.....	118.92	45.52	254.14	1,966

The calorific value of this ration could be increased by adding a larger proportion of fat, as the calorific value of this component is more than double that of protein or carbohydrates, but the liability of fat to cause digestive disturbances and also to undergo decomposition when in combination with vegetable substances has led to its rigid exclusion from the ration except in the small amounts found combined in the other constituents of the ration. The aim has been: First, to form such a combination as would be readily and completely digested by the most delicate stomach under all service conditions; second, to pack the greatest nutritive value in the smallest possible weight and bulk by eliminating all waste materials and nonessential water and reducing the resulting substance to the smallest possible bulk; third, to determine what amount of this food is absolutely needed for one day's subsistence, and thus fix the size and weight of the contemplated ration.

These conditions have been carried out in the ration above formulated. Its digestibility is perfect, every particle of the nutrient being utilized by the system. The completed ration contains less than 6 per cent of water and occupies when ready for packing but 25 cubic inches, while an equal weight of hard bread occupies 72 cubic inches, and the authorized emergency ration 49 cubic inches.

Having in mind the force value of the various components the amount of this food necessary for one day's subsistence has been fixed at the amount given in the above table.

A quantity of the meat and bread component was now manufactured and some sweet chocolate containing the proportions of chocolate and sugar recommended also

obtained. Numerous experiments were made as to the best method of using the ration and the following directions evolved, which it is thought will meet every service condition:

"Chocolate.—May be eaten dry or one cake boiled in 1 pint of water.

"Meat and bread component.—May be eaten dry or stirred into cold water and eaten, or one cake may be boiled in 3 pints of water for five minutes and the resulting soup seasoned to taste (longer boiling improves this soup), or one cake may be boiled in 1 pint of water for five minutes to make thick porridge. Eat hot or cold. When cold may be sliced and fried, if bacon or other fat is available. Salt and pepper in end of can for extra seasoning."

The question of the proper package was next considered. Experiments were made with a can having an elliptical cross section (regarded as the best shape for carriage on the person of the soldier) and it was found that by compressing its various components into cakes the entire ration could be placed in such a can measuring $2\frac{1}{2}$ by $1\frac{1}{2}$ by $6\frac{1}{2}$ inches. It was therefore determined to pack the ration in a sealed tin can similar to the one described and fitted with a key to facilitate opening.

The ration should be prepared for packing in cans as follows: Meat and bread component to be compressed into three cakes of 4 ounces each, each cake to be separately wrapped in paper. Chocolate and sugar component also to be compressed into three cakes of equal weight and each cake to be separately wrapped in foil. Three-fourth ounce of salt and 1 gram cayenne pepper to be packed in can with each ration for extra seasoning. (It is found that more seasoning is needed when the ration is made into soup than when eaten dry.)

Owing to the small amount of water in the bread and meat component the compressed cakes, although considerably reduced in volume, are very friable and can readily be crumbled in the hand and reduced to the same condition as before compression.

The directions should be printed on the wrappers of each cake. The following should be printed on the exterior of the can, preferably on the tin itself and not on a paper label:

"Emergency ration.—Not to be opened except by order of an officer or in extremity. To be carried in the haversack or saddlebags and accounted for at inspections, etc. This ration is calculated to subsist a man for one day, maintaining his full strength and vigor. Directions inside."

Having definitely determined on the composition, preparation, and packing of the ration, a quantity of the material was made up and every opportunity taken to obtain the opinion of those likely to be interested in the subject as to its healthfulness, palatability, nutritive powers, etc. As to its palatability there is no dispute, everyone who has tried it has pronounced it far superior to anything else of the kind shown.

In order to obtain in a small way an indication as to its practical value a member of the board subsisted exclusively on the ration from May 14 to May 16, inclusive, and from July 12 to 14, inclusive. The results as noted at the time were as follows. First test: Loss of weight in three days, $1\frac{1}{2}$ pounds. With the exception of one meal (when the ration was stirred in cold water only) the food was eaten dry, including the chocolate, and it never lost its palatability. It was eaten slowly as the coarseness of the particles rendered it pleasant to chew, and it was thus thoroughly mixed with the saliva. No disagreeable effects of any kind were experienced, bowels were perfectly regular and the evacuations indicated the food was perfectly digested. No hunger was felt after eating, and no more than the usual desire for food before meals. Muscular strength and vigor were fully maintained and positively no evil effects, either physical or mental, experienced. Second trial: Results first rate. Strength fully kept up. No hunger. Digestion first class. Loss in weight during the three days' trial $1\frac{1}{2}$ pounds, but no discomfort whatever experienced and condition in every respect as good as if ordinary food had been eaten. One great advantage of the food is that one does not become tired of it. It was appetizing all the time. The food was eaten dry except for four meals when the meat and bread component was made into soup. This trial so far as it went produced exactly the results that would be expected from a study of the chemical composition of the ration. As the ration contained the full amount of protein necessary to repair the waste of muscular tissue and preserve full bodily and mental vigor, no loss of strength or depression of spirits was experienced. The amount of fat and hydrocarbons not being sufficient to supply all the fuel necessary for the system the deficiency was supplied from the stored-up fat of the body, without any discomfort or inconvenience. In short, the results of this somewhat limited practical trial have completely borne out the theory of the emergency ration as indicated earlier in these proceedings.

In order to enable the board to make a thorough practical test of the proposed ration, the following letter was now addressed to the Commissary-General of Subsistence:

WAR DEPARTMENT,
Washington, D. C., August 3, 1900.

The COMMISSARY-GENERAL, U. S. A.

SIR: I have the honor to inform you that the board on emergency rations, after examining and testing all samples of emergency foods submitted for its consideration both from your office and from the various manufacturers of such articles, and after consulting all available sources of information with reference to the adaptability of the various existing foods of this character to their purpose, was unable to find one that fulfilled the essential qualifications of such a ration.

The board therefore took up the study and investigation of the various food materials with a view of combining them, if possible, into a suitable emergency ration.

After extensive research and experimenting, the board has at length formulated a ration which seems likely to answer the purpose better than anything that has been brought to its notice. From a theoretical point of view, this ration leaves little to be desired. It is composed of articles easily digested and not liable to cause intestinal or other disorders. It contains sufficient nutriment to maintain a man in full muscular strength and activity during the period it is used. It possesses a minimum of weight and bulk, weighing, exclusive of package, 1 pound, and measuring about 28 cubic inches, while an equal weight of hard bread measures 72 cubic inches. It is acceptable to the taste. Its keeping qualities are excellent. It contains less than 7 per cent of water, making it a practically water-free compound. It can be eaten just as it is or after further cooking.

It does not pall on the taste. It is just as acceptable after being used exclusively for three days as on the first day. Both the materials of which it is composed and the compounded ration itself have been kept exposed to the air for months without apparent deterioration. Small quantities of the ration have been manufactured by the board and submitted to persons likely to be interested in the subject, including a number of officers and enlisted men, and so far nothing but words of commendation have been heard.

The only trial of a practical nature made so far was by a member of the board, who subsisted exclusively on the ration from May 14 to May 16, inclusive, and from July 12 to July 14, inclusive. In both trials the results were excellent, no discomfort of any kind being experienced, either physical or mental. There was a slight loss of weight in each trial, amounting to $1\frac{1}{4}$ pounds during the first three days and $1\frac{1}{2}$ pounds during the second trial. This loss was, however, to be expected, as the ration is calculated to supply the full muscle-making component required, but assumes that a portion of the bodily fuel required will be supplied by the stored-up fat of the body.

The board is much encouraged over the results already obtained as above set forth, but in order to enable it to determine whether the practical are equal to the theoretical advantages of this food further investigation is desired. The board therefore requests:

First. That authority be obtained for the manufacture of 2,000 of these rations, under the personal supervision of the board.

Second. That when these rations are completed the members of the board be authorized to proceed to various military stations (preferably those situated in sparsely settled sections or on Indian reservations where marching troops will have no opportunity or temptation to procure other food than that they carry) and make exhaustive, practical tests, by actual field service with detachments of troops carrying only this ration, each detachment being supplied with portable scales, etc., to enable a complete record to be kept of each man's physical condition from day to day.

By making tests as above outlined, the board will be able to speak positively as to the merits and demerits of the proposed ration, and thus avoid the possibility of future disaster due to dependence on an article of food whose value and properties are not absolutely known beforehand, both theoretically and practically.

Very respectfully,

C. A. DEMPSEY,
Lieutenant-Colonel First Infantry, President of the Board.

On August 17, 1900, the above letter was returned to the board with the following indorsements:

[First indorsement.]

WAR DEPARTMENT,
OFFICE COMMISSARY-GENERAL OF SUBSISTENCE,
Washington, August 7, 1900.

Respectfully referred to the Adjutant-General of the Army, recommending that the honorable the Secretary of War be requested to grant authority for the purchase of 2,000 of these emergency rations, and that they be prepared under the supervision of the board, and when completed that the board be authorized to make the test suggested in this letter. It is further recommended that the necessary orders directing the travel of the board be issued.

J. F. WESTON,
Acting Commissary-General of Subsistence.

[Second indorsement.]

ADJUTANT-GENERAL'S OFFICE,
Washington, August 10, 1900.

Respectfully submitted to the Secretary of War. Recommended.

H. C. CORBIN,
Adjutant-General.

[Third indorsement.]

WAR DEPARTMENT, August 11, 1900.

Approved: At the same time let a similar test be made with an equal number of the standard emergency rations, under similar conditions (meaning the ration approved by Generals MacArthur, Young, Lawton, etc.).

ELIHU ROOT,
Secretary of War.

[Fourth indorsement.]

ADJUTANT-GENERAL'S OFFICE,
Washington, August 15, 1900.

Respectfully returned to the Acting Commissary-General of Subsistence, U. S. A., inviting attention to the third indorsement hereon.

It is requested that the military stations at which the board desires to make the tests of the emergency ration be designated.

W. H. CARTER,
Assistant Adjutant-General.

[Fifth indorsement.]

WAR DEPARTMENT,
OFFICE COMMISSARY-GENERAL OF SUBSISTENCE,
Washington, August 17, 1900.

Respectfully referred to the board of officers on emergency ration, office Commissary-General of Subsistence, with request for designation of the post where a trial is to be made and the place where the ration is to be manufactured.

J. F. WESTON,
Acting Commissary-General of Subsistence.

The board immediately set to work to ascertain where the proper facilities could be obtained to manufacture the 2,000 rations authorized. The Armour Packing Company, of Kansas City, kindly offered, through the vice-president of the company, Mr. C. W. Armour, the use of their extensive plant for the purpose and it was determined to recommend that the rations be manufactured at that point.

It was also decided to recommend Fort Reno, Okla., and Fort Niobrara, Nebr., as the two stations from whence the tests should be made. This for the double reason that one is situated in a northern and the other in a southern locality, and that the former is garrisoned by cavalry and the latter by infantry.

At this stage of the proceedings the following order was issued relieving Lieut. Col. C. A. Dempsey, as a member of the board:

SPECIAL ORDERS, }
No. 197. }

HEADQUARTERS OF THE ARMY,
ADJUTANT-GENERAL'S OFFICE,
Washington, August 22, 1900.

[Extract].

* * * * *

27. By direction of the Secretary of War, Lieut. Col. Charles A. Dempsey, First U. S. Infantry, is relieved from further duty as a member of the board of officers

appointed to meet in this city at the War Department by paragraph 19, Special Orders, No. 295, December 20, 1899, from this office, for the purpose of considering and reporting upon the matter of the composition of the ration for the use of troops in tropical climates, and will proceed to join his regiment. The travel enjoined is necessary for the public service.

* * * * *

By command of Lieutenant-General Miles:

H. C. CORBIN,
Adjutant-General.

Lieut. Col. Charles A. Dempsey having been relieved as a member of the board, it was determined that the proceedings to date should be signed.

C. A. DEMSEY,
Lieutenant-Colonel First Infantry, President.

On August 24 the preceding letter was returned with the following indorsement:

WAR DEPARTMENT, *August 24, 1900.*

Respectfully returned to the Acting Commissary-General of Subsistence, Washington, D. C.

The board desires to proceed to New York City to procure certain materials required in the manufacture, thence to Kansas City, Mo., where the Armour Packing Company has tendered the services of its force and the use of its plant required for the manufacture of the emergency rations under the personal direction of the board.

When the rations are completed the board desires to make the tests at the military stations at Fort Reno, Okla., and Fort Niobrara, Nebr.

S. W. FOUNTAIN,
Captain, Eighth Cavalry.

On August 29 the following order was received by the board:

SPECIAL ORDERS, }	HEADQUARTERS OF THE ARMY, ADJUTANT-GENERAL'S OFFICE, <i>Washington, August 28, 1900.</i>
No. 202. }	[Extract.]

* * * * *

34. By direction of the Secretary of War, the members of the board of officers appointed in paragraph 19, Special Orders, No. 295, December 20, 1899, from this office, will proceed to New York City, N. Y., Kansas City, Mo., and Fort Reno, Okla., on official business pertaining to tests of the emergency ration recommended by said board and the standard emergency ration, and upon the completion of this duty will return to their proper stations. The travel enjoined is necessary for the public service.

* * * * *

By command of Lieutenant-General Miles:

H. C. CORBIN,
Adjutant-General.

September 1, 1900, the board proceeded to New York City as directed in the preceding order. The establishment under control of the New Jersey Milling Company, where the "kiln dried cooked wheat" previously described is prepared, was then visited, the process of manufacture examined, and the amount of the completed product required for the 2,000 rations authorized purchased and ordered shipped to Kansas City, Kans. The board then visited the Maillard chocolate factory and made the same arrangement in regard to the chocolate component of the ration. This to be prepared by combining equal amounts of pure chocolate and pure sugar. The product to be molded into cakes of one and one-third ounces each, of a shape and size to pack readily in the proposed can, and each cake to be separately wrapped in foil.

All the necessary material having been purchased and arrangements made for its shipment to Kansas City, the board proceeded to that city.

On calling on the Armour Packing Company the resources of so much of its plant as were necessary in the work were at once placed at the service of the board, and all employees directed to lend all possible assistance to the board, both in the manufacture of the ration itself and of the implements and machinery needed to turn out the completed product packed in cans ready for issue or shipment. Attention was at once directed to the preparation of desiccated beef. Although some experiments in this line had been made by the company, no satisfactory result had been attained. Fresh experiments were at once instituted under direction of the board, and after numerous failures and partial successes a product was finally obtained which was superior even to that purchased and used in formulating the ration. This desiccated

beef as finely prepared and ready for incorporation in the ration was in the form of a grayish flour containing less than 5 per cent of water, and actual analysis showed that it contained all the nutriment of the beef, only the water having been gotten rid of in the drying process.

The planning and construction of the pans for parching the grain and the press to be used in pressing the completed ration into cakes also took considerable time and attention, and it was only after several weeks' work that the actual manufacture of the ration could be commenced. When the machinery was perfected and all the materials assembled, work on the ration was at once commenced and rapidly pushed to a conclusion. On examination it was found that the cakes of chocolate were under weight, three weighing but $3\frac{1}{2}$ ounces instead of 4, as ordered. Investigation showed that this was the error of the mold maker, he having taken the smaller base of the slightly tapering model cake as the larger base of his mold. The entire amount having been delivered, considerable delay would have resulted from any attempt to correct this mistake. It was therefore determined to use the light-weight cakes and in addition to carry an extra supply to be used in raising the chocolate ration to full weight if circumstances rendered this necessary or desirable. (This latter was never used, and the rations used during the trial contained but $3\frac{1}{2}$ ounces of chocolate instead of 4, as in the original formula.)

From the experience gained in the preparation of these rations the following set of specifications have been prepared, which it is believed cover all necessary requirements:

FORMULA AND SPECIFICATIONS FOR UNITED STATES ARMY EMERGENCY RATION.

"This ration consists of a chocolate component and a bread and meat component"

"The chocolate component to be prepared by combining equal weights of pure chocolate and pure sugar, the product being equal in quality to the sample cakes in the office of the Commissary-General.

"The meat component to be prepared by taking fresh lean beef, free from visible fat and sinew, grinding it in a meat grinder, and then evaporating its moisture by the use of sufficient heat to thoroughly desiccate it, care being taken never to allow the heat to rise sufficiently high to cook the meat in the slightest degree. When the amount of moisture is reduced to 5 per cent or below, the dried product is reduced to powder and carefully sifted through a fine-meshed sieve. The resulting meat flour constitutes the meat component of the ration.

"The bread component to be prepared by taking a 'cooked wheat, kiln dried, with the outer bran removed,' similar to that prepared by the Jersey City Milling Company, parching it, and then grinding to a coarse powder. The resulting product constitutes the bread component of the ration.

"To compound the combined meat and bread ration, sixteen parts by weight of the former, thirty-two parts of the latter, and one part of common salt are thoroughly mixed together in such a manner and in sufficiently small quantities as to insure a perfectly homogeneous product.

"The ration to be prepared for packing in cans as follows:

"Meat and bread component to be compressed into cakes weighing 4 ounces each, having an oval-shaped base measuring about $1\frac{1}{2}$ by $2\frac{1}{2}$ inches, and compressed until not over $1\frac{1}{2}$ inches in thickness. Each cake to be separately wrapped in paper, on which the following directions are printed:

"*Meat and bread component.*—May be eaten dry, or stirred into cold water and eaten, or one cake may be boiled in 3 pints of water for five minutes and the resulting soup seasoned to taste (longer boiling improves this soup), or one cake may be boiled in 1 pint of water for five minutes to make thick porridge. Eat hot or cold. When cold, may be sliced and fried if bacon or other fat is available. Salt and pepper in end of can for extra seasoning."

"Chocolate component to be molded into cakes of $1\frac{1}{2}$ ounces each, having the same sized base as the other component. Each cake to be separately wrapped in foil.

"Cans to be similar, in size, shape, and construction, to the samples in the office of the Commissary-General; to be lacquered, and to have the following printed or lithographed on the side:

"*U. S. Army emergency ration.*—Not to be opened except by order of an officer or in extremity. To be carried in the haversack or saddle bags and accounted for at inspections, etc.

"This ration is calculated to subsist a man for one day, maintaining his full strength and vigor. Directions inside."

"Each can to contain 3 cakes of the meat and bread component, 3 cakes of chocolate, three-fourths of an ounce of fine salt, and 1 gram of red pepper. The salt to be contained in a pasteboard box or small envelope, and the pepper wrapped in paper.

These components to be placed in the cans in the order mentioned and the can hermetically sealed.

"The cans to be packed in strong wooden cases, securely bound with iron, each case to contain 50 cans."

The rations having been completed, a sufficient number for the practical trials was shipped to Fort Reno, Okla.

On September 15th the following order was received:

SPECIAL ORDERS, }
No. 211. }

HEADQUARTERS OF THE ARMY,
ADJUTANT-GENERAL'S OFFICE,
Washington, September 8, 1900.

[Extract.]

* * * * *
11. By direction of the Acting Secretary of War, Capt. Jefferson D. Poindexter, assistant surgeon, U. S. A., will report in person to the senior member of the board of officers, appointed by paragraph 19, Special Orders, No. 295, December 20, 1899, from this office, upon the arrival of that board at Fort Reno, Okla., for the purpose of accompanying the command that may be detailed to make a practical test of the emergency ration.

* * * * *
By command of Lieutenant-General Miles:

H. C. CORBIN,
Adjutant-General.

On October 12th the following communication was received:

HEADQUARTERS OF THE ARMY,
ADJUTANT-GENERAL'S OFFICE,
Washington, October 9, 1900.

Lieut. Col. CHARLES A. DEMPSEY,
First United States Infantry, Fort Reno, Okla.

SIR: In addition to the two emergency rations ordered to be tested by the board of officers on a tropical ration at Fort Reno, Okla., under paragraph 34, Special Orders, No. 202, August 28, 1900, from this office, the Lieutenant-General Commanding the Army desires me to inform you that, in accordance with the recommendation of the Acting Commissary-General of Subsistence, of the 6th instant, the Acting Secretary of War directs that the board test the emergency ration prepared by Armour & Co., which ration the Subsistence Department has been directed to forward to the board.

Very respectfully,

GEORGE ANDREWS,
Assistant Adjutant-General.

The business at Kansas City having been completed the board proceeded to Fort Reno, Okla., to carry out the actual trials of the various rations awaiting its action. On consulting the post commander the board was informed that a detail of 25 men would be furnished for each trial with the necessary transportation and equipage.

Capt. J. D. Poindexter, assistant surgeon, having reported to the president of the board in accordance with the order previously given was informed that his duties would be the ordinary ones of a medical officer when attached to a command.

In view of the probable importance of these trials and the desirability of so conducting them as to give a basis of comparison between the three rations to be tested, the following plan or scheme was determined on:

Each trial to be preceded by two days' marching on ordinary rations, to accustom the men composing the detachment to field service and prevent them from confusing any fatigue or weakness due to the change from garrison life to field service with the real effect of the emergency ration.

Marches to be so arranged that the end of the second day will find the command in the Indian country south of the Canadian River, and thereafter camps to be made at points remote from habitations, to reduce the temptation for men to obtain food surreptitiously should the emergency ration fail to satisfy hunger.

Each march to be conducted as in ordinary field service, with the necessary camp work and guard duty. A day's march, however, while the command is on emergency rations, not to exceed about 16 miles, to minimize the chances of confounding the fatigue or weakness that might fairly be attributed to a limited diet with that likely to be produced in men young in the service and unaccustomed to camp life by work harder and more wearing than they were accustomed to.

Each trial to consist of a five days' march, subsisting exclusively on the emergency ration during that period.

A set of scales to be taken along. Each man's weight to be taken daily and his physical condition observed. To prevent an apparent change in weight due to a

change in clothing, or to the change of being wet from storms, perspiration, etc., these weights to be taken with the men stripped to their undershirts, drawers, and socks.

Each man to be questioned during and after the trial as to bring out clearly his own impressions as to how the ration affected him.

During the trials the ration formulated by the board will be known as No. 1; the standard emergency ration as No. 2; the Armour & Co. ration as No. 3.

When each ration has been tested as above outlined, a fourth trial to be made of the one which in the opinion of the board has best satisfied the requirements of an emergency ration. This trial to be made with as large a command as can be gotten together, under actual service conditions in every respect. Full marches to be made, and the command treated exactly as if making an ordinary march through the country. No special observations to be made during the trip, but each man to be questioned and his condition observed when the march is concluded.

November 3, 1900.—A detachment consisting of Capt. S. W. Fountain, Eighth Cavalry; Capt. J. D. Poindexter, assistant surgeon; Capt. F. W. Foster, Fifth Cavalry; Ben Clark, guide; 25 enlisted men, Troop A, Eighth Cavalry; 1 private, hospital corps, and 4 civilian teamsters left Fort Reno for the trial of No. 1 ration. On November 5 the entire command was put on this ration and kept on it for five days. At the termination of the trial every one was well and strong, and every member of the command testified to being in as good condition as if ordinary rations had been used. There were but 3 men on sick report during the trip and their cases yielded readily to treatment. When the second command was sent out the greater part of this detachment volunteered to accompany it, which would indicate that this ration had been ample for subsistence. The net loss in weight of the 34 men subsisting on the ration during the trial was 7½ pounds. Although the variation in weight of particular men on succeeding days seemed sometimes anomalous it is probable that the collective weights and differences give a fair idea of the actual conditions and changes. The result of this trial was extremely favorable to No. 1 ration. The observations of the board and opinions of those using the ration were in unison as regards its great advantages. Soldiers with several years of service to their credit were particularly enthusiastic in regard to it and even the raw recruits, and the greater part of the detachment consisted of this class of men, testified that the ration fully kept up their health and strength.

The following questions were propounded with a view of eliciting the individual opinions and experiences of each member of the command. The first series being asked while the trial was going on, and the second when it was concluded and the command had returned to the post. In answering these questions the men were told that they were only intended as suggestions as to what it was desired to bring out, the idea being that each man should give his opinions in any manner and to any extent desired.

FIRST SERIES.

Has the ration satisfied your hunger?
Has it kept up your strength?
Do you feel able to perform all duty?
Have you felt any ill effects in either stomach or bowels after eating it?

SECOND SERIES.

Did you live exclusively on the emergency ration during the five days' trial?
What effect did this ration have on your health and strength?
Did it continue palatable all the time you were using it?
Did it disagree with you while you were eating it?
Did you have any sickness or disagreeable feelings that could fairly be attributed to the ration?

What was your physical condition while living on this ration as compared to what it ordinarily is?

The answers of the various men to these questions are as follows:

Capt. S. W. Fountain, Eighth Cavalry.—Year of service, thirty-sixth. Weight when trial commenced, 176 pounds; when trial ended, 174 pounds; loss, 2 pounds. Greatest weight, 176 pounds; least, 174 pounds.

In answer to questions put on the evening after the first day's use of the ration, and repeated on the second and third day, Captain Fountain stated:

"The ration has satisfied my hunger. It has kept up my strength. I feel able to perform all duty. I have felt no ill effects in either stomach or bowels after eating it.

"I lived exclusively on this ration for five consecutive days. I did not eat all the ration, because I did not seem to need it. I did all duty and remained in perfect physical condition. The ration was thoroughly palatable all the time."

Capt. J. D. Poindexter, assistant surgeon.—Year of service, fourteenth. Weight when trial commenced, 158 pounds; when trial ended, 157½ pounds; loss, ½ pound. Greatest weight, 159 pounds; least, 157½ pounds.

Questioned in the same manner as Captain Fountain:

"The ration has satisfied my hunger. It has kept up my strength. I feel able to perform all duty. I have felt no ill effects in either stomach or bowels after eating it."

Captain Poindexter did not eat the entire ration, and stated he had enough and did not need the whole amount.

On the termination of the trial he was not questioned, such further questioning being confined to the enlisted men of the command.

Capt. F. W. Foster, Fifth Cavalry.—Year of service, twenty-eighth. Weight when trial commenced, 165½ pounds; when trial ended, 165½ pounds; no change. Greatest weight, 168 pounds; least, 165½ pounds.

Questioned as before, he stated:

"The ration has satisfied my hunger. It has kept up my strength. I feel able to perform all duty. I have felt no ill effects in either stomach or bowels after eating it."

"I lived exclusively on the emergency ration during the five days' trial. It had no effect whatever on my health and strength; I felt just as well and was apparently in the same physical condition as when living on ordinary food. Usually after the day's march was over I spent several hours walking and hunting and felt no symptoms of exhaustion and experienced no more fatigue than during the time I was subsisting on the ordinary ration. I never suffered from hunger, but at mealtimes always had a good appetite, and the food was palatable to the last day. As far as my physical condition would indicate I could apparently have subsisted exclusively on this ration for an indefinite time."

W. M. Gaus, quartermaster-sergeant, Troop A, Eighth Cavalry.—Twelfth year of service. Weight when trial commenced, 151 pounds; when trial ended, 150 pounds; loss, 1 pound. Greatest weight, 151 pounds; least, 147 pounds.

Questioned during the trial:

"The ration has satisfied my hunger. It has kept up my strength. I feel able to perform all duty. I have felt no ill effects in either stomach or bowels after eating it."

After the termination of the test and the return of the detachment to the post, Sergeant Gaus also stated in answer to questions:

"I lived exclusively on the ration during the five days' trial. My health and strength were exactly the same as on ordinary food. The ration continued palatable all the time I was using it; it tasted just as good at the end as at first. It never disagreed with me while I was eating it. I had no sickness or disagreeable feelings that could fairly be attributed to the ration. My physical condition while living on this ration was just the same as it ordinarily is. I felt all right when the trial was over; was not even hungry. I could get along on this ration for six or more days in an emergency without suffering or disagreeable effect and keep up my full health and strength."

Herman Weinmann, sergeant, Troop A, Eighth Cavalry.—Twentieth year of service. Weight when trial commenced, 141 pounds; when trial ended, 141 pounds; no change. Greatest weight, 141 pounds; least, 137½ pounds.

Questioned during the trial:

"The ration has satisfied my hunger. It has kept up my strength. I feel able to perform all duty. I have felt no ill effects in either stomach or bowels after eating it."

At end of trial, stated:

"I lived exclusively on the ration during the five days' trial. I felt first-rate all the time. The ration continued palatable all the time I was using it. It never disagreed with me while I was eating it. I had no sickness or disagreeable feelings. My physical condition while living on this ration was just the same as it ordinarily is."

Otto C. Langfell, corporal, Troop A, Eighth Cavalry.—Fifth year of service. Weight when trial commenced, 141½ pounds; when trial ended, 144 pounds; gain, 2½ pounds. Greatest weight, 144 pounds; least, 140 pounds.

Questioned during trial:

"The ration has satisfied my hunger. It has kept up my strength. I feel able to perform all duty. I have felt no ill effects in either stomach or bowels after eating it."

Questioned after termination of trial:

"I lived exclusively on the emergency ration during the five days' trial. It had no effect on my health and strength that I know of. It continued palatable all the time; it tasted better at the last than at first. It never disagreed with me while I was eating it. I had no sickness or disagreeable feelings. My physical condition while living on this ration was the same as it ordinarily is."

Alfred B. Stedman, corporal, Troop A, Eighth Cavalry.—Fifth year of service. Weight when trial commenced, 121½ pounds; when trial ended, 124 pounds; gain, 2½ pounds. Greatest weight, 124 pounds; least, 119½ pounds.

Questioned during trial:

"The ration has satisfied my hunger. It has kept up my strength. I feel able to perform all duty. I have felt no ill effects in either stomach or bowels after eating it."

Questioned after termination of trial:

"I have lived exclusively on the emergency ration during the five days' trial. My health and strength were just the same as ordinary. The longer I used the ration the more palatable it became. The first day or two I felt as if I wanted something more, but when I got used to it, it was all right and satisfied me. It never disagreed with me while I was eating it. I was a little constipated, but not enough to bother me. I could notice the difference. My physical condition was just the same as it ordinarily is."

Frank S. Higginmiller, corporal, Troop A, Eighth Cavalry.—Fourth year of service. Weight when trial commenced, 137½ pounds; when trial ended, 133 pounds; loss, 4½ pounds. Greatest weight, 137½ pounds; least, 132½ pounds.

Questioned during trial, stated on first day:

"I feel hungry and would like more. It has kept up my strength. I feel able to perform all duty. I have felt no ill effects after eating it."

On second day and thereafter, stated that his hunger was satisfied. First day ate the food stirred in cold water only. Afterwards had it cooked into soup.

Questioned after termination of trial:

"I have lived exclusively on the emergency ration during the five days' trial. It had no effect on my health and strength. I felt just as usual. The ration continued palatable all the time and tasted better at the end of the trial than at the beginning. It never disagreed with me while I was eating it. I suffered somewhat from constipation and took some physic and got over it at once. My physical condition while living on this ration was about the same as it ordinarily is."

James G. Crum, cook, Troop A, Eighth Cavalry.—First year of service. Weight when trial commenced, 174 pounds; when trial ended, 173½ pounds; loss, one-half pound. Greatest weight, 174 pounds; least, 170 pounds.

Questioned during trial:

"The ration has satisfied my hunger. It has kept up my strength. I am able to perform all duty. I have felt no ill effects in either stomach or bowels after eating it."

Questioned after termination of trial:

"I lived exclusively on the emergency ration during the five days' trial. It had no effect whatever on my health and strength. It continued palatable all the time I was using it. It never disagreed with me. I was never sick. My physical condition was just about the same while living on this ration as it ordinarily is."

Ira D. Davis, wagoner, Troop A, Eighth Cavalry.—Second year of service. Weight when trial commenced, 137½ pounds; when trial ended, 137½ pounds; no change. Greatest weight, 137½ pounds; least, 134 pounds.

Questioned during trial:

"The ration has satisfied my hunger. It has kept up my strength. I am able to perform all duty. I have felt no ill effects in either stomach or bowels after eating it."

Questioned after termination of trial:

"I ate about 3 hard-tacks the second day in addition to the ration, otherwise I lived on the ration. I had good health all the time and my strength kept up. The ration was palatable to me all the time I was using it. It did not disagree with me while I was eating it. I was never sick. My physical condition while living on the ration was just about the same as ordinary. I couldn't see any difference."

Charles F. Adams, private, Troop A, Eighth Cavalry.—First year of service. Weight when trial commenced, 128 pounds; when trial ended, 127½ pounds; loss, one-half pound. Greatest weight, 128½ pounds; least, 126 pounds.

Questioned during trial:

"The ration has satisfied my hunger. It has kept up my strength. I feel able to perform all duty. I had a cramp in my stomach the first two days; after that all right."

Questioned after termination of trial:

"I lived exclusively on the emergency ration during the five days' trial. It had no effects on my health and strength. I felt just the same as usual. It was palatable all the time I was using it and got better the longer I used it. It never disagreed with me while I was eating it. I had cramps in my stomach the first two days; afterwards was all right. My physical condition was the same as ordinary."

Orville H. Farley, private, Troop A, Eighth Cavalry.—First year of service. Weight when trial commenced, 140½ pounds; when trial ended, 140 pounds; loss, one-half pound. Greatest weight, 140½ pounds; least, 138½ pounds.

Had an attack of diarrhea the night before he commenced eating the ration.

Questioned during trial:

"The ration has satisfied my hunger. It has kept up my strength. I am able to perform all duty. I have felt no ill effects in either stomach or bowels; on the contrary, my diarrhea has ceased."

Questioned after termination of trial:

"I lived exclusively on the emergency ration during the five days' trial. It had no effect at all on my health and strength. I felt just the same as ordinary. The ration was palatable all the time I was using it. It never disagreed with me and I was never sick. My physical condition while living on the ration was just the same that it ordinarily is."

Benjamin F. Carnes, private, Troop A, Eighth Cavalry.—First year of service. Weight when trial commenced, 141 pounds; when trial ended, 144 pounds; gain, 3 pounds. Greatest weight, 144 pounds; least, 130 pounds.

After the first meal this man complained of suffering from hunger and was given an extra 4-ounce cake of food.

Questioned during trial:

"The ration has satisfied my hunger, but on the first day I had an extra cake; afterwards it was all right. It kept up my strength. I am able to perform all duty. I have felt no ill effects in either stomach or bowels after eating it."

Questioned after termination of trial:

"I have lived exclusively on the emergency ration during the five days' trial. It had no effect whatever on my health and strength. It continued palatable all the time I was using it. It did not disagree with me while I was eating it, and I was never sick. My physical condition was about the same while living on this ration that it ordinarily is."

Joseph Grucza, private, Troop A, Eighth Cavalry.—First year of service. Weight when trial commenced, 123½ pounds; when trial ended, 126½ pounds; gain, 3 pounds. Greatest weight, 126½ pounds; least, 122 pounds.

Questioned during trial:

"The first day I gave a great part of my ration away, as I did not like it, and felt weak. The second day and thereafter I ate the ration and was all right, and was able to perform all duty. I felt no ill effects in either stomach or bowels after eating the ration."

Questioned after termination of trial:

I lived exclusively on the emergency ration during the five days' trial. My health and strength were all right. The ration tasted good all the time after the first day. It never disagreed with me and I was never sick. My physical condition was all right, just the same while living on this ration as it ordinarily is."

George W. Hiltz, private, Troop A, Eighth Cavalry.—First year of service. Weight when trial commenced, 135 pounds; when trial ended, 136 pounds; gain, 1 pound. Greatest weight, 136 pounds; least, 132½ pounds.

Questioned during trial:

"The ration has satisfied my hunger. It has kept up my strength. I am able to perform all duty. I have felt no ill effects in either stomach or bowels after eating it."

Questioned after termination of trial:

"I lived exclusively on the emergency ration during the five days' trial. My health and strength were just the same as usual. The ration tasted good to the last. It never disagreed with me, and I had no sickness that could be attributed to it. It corrected a looseness in my bowels I was suffering from. My physical condition was better while living on this ration than it had been previously. The ration corrected the looseness in my bowels and caused me to make my water better. I had been irregular previously."

Frank P. Hoppe, private, Troop A, Eighth Cavalry.—First year of service. Weight when trial commenced, 158 pounds; when trial ended, 153½ pounds; loss, 4½ pounds. Greatest weight 158 pounds; least, 152½ pounds.

Questioned during trial:

First day: "Can't eat the ration; tastes disagreeably to me. Strength is kept up yet."

Second day: "The ration satisfied my hunger. I could eat it all right. My strength was kept up. I was able to perform all duty. Have felt no ill effects in either stomach or bowels after eating the ration."

Questioned after termination of trial:

"I lived exclusively on the emergency ration during the five days' trial. It had no effect on my health and strength at all. At first I didn't like it, but the third day

it was all right. It didn't disagree with me and I was never sick. My physical condition was just the same while living on this ration as what it ordinarily is."

Henry C. Lewis, private, Troop A, Eighth Cavalry.—First year of service. Weight when trial commenced, 139 pounds; when trial ended, 137½ pounds; loss, 1½ pounds. Greatest weight, 139 pounds; least, 137 pounds.

Questioned during trial:

"The ration has satisfied my hunger. It has kept up my strength. I am able to perform all duty. I have felt no ill effects in either stomach or bowels after using it."

Questioned after termination of trial:

"I lived exclusively on the emergency ration during the five days' trial. It had no effect whatever on my health and strength. It continued palatable all the time I was using it. It never disagreed with me, and I was never sick during the trial. My physical condition while living on this ration was just the same that it ordinarily is."

Emmet F. Lyon, private, Troop A, Eighth Cavalry.—First year of service. Weight when trial commenced, 165½ pounds; when trial ended, 167 pounds; gain, 1½ pounds. Greatest weight, 167 pounds; least, 163½ pounds.

Questioned during trial:

"The ration has satisfied my hunger. It has kept up my strength. I am able to perform all duty. On the third and fourth days I had a slight headache. This was all gone on the fifth day. I felt no other ill effects."

Questioned after termination of trial:

"I lived exclusively on the emergency ration during the five days' trial. It had no effect whatever on my health and strength. It continued palatable all the time and it tasted better toward the last than at first. It never disagreed with me, and I had no sickness or disagreeable feelings that could fairly be attributed to it. I couldn't see any difference in my physical condition from what it ordinarily is. I felt just as usual."

John F. Martin, private, Troop A, Eighth Cavalry.—First year of service. Weight when trial commenced, 149 pounds; when trial ended, 148½ pounds; loss, one-half pound. Greatest weight, 149 pounds; least, 146½ pounds.

Questioned during trial:

"The ration has satisfied my hunger. It has kept up my strength. I am able to perform all duty. I have felt no ill effects in either stomach or bowels after eating it."

Questioned after termination of trial:

"I have lived exclusively on the emergency ration during the five days' trial. It had no effect on my health and strength. It continued palatable all the time I was using it. It never disagreed with me. I had no sickness. My physical condition was just the same while living on this ration as it ordinarily is."

Andrew Meyers, private, Troop A, Eighth Cavalry.—First year of service. Weight when trial commenced, 147½ pounds; when trial ended, 149½ pounds; gain, 2 pounds. Greatest weight, 149½ pounds; least, 145½ pounds.

Questioned during trial:

"The ration satisfied my hunger. It has kept up my strength. I am able to perform all duty. I have felt no ill effects in either stomach or bowels after eating it."

Questioned after termination of trial:

"I lived exclusively on the emergency ration during the five days' trial. I was just the same when the trial ended as when it commenced. I could see no difference. The ration was palatable all the time I was eating it. It never disagreed with me and I was never sick. My physical condition while living on the ration was just the same as it ordinarily is."

Earl Newman, private, Troop A, Eighth Cavalry.—First year of service. Weight when trial commenced, 152 pounds; when trial ended, 146 pounds; loss, 6 pounds. Greatest weight, 152 pounds; least, 144 pounds.

Questioned during trial:

"The ration has satisfied my hunger. It has kept up my strength. On the second day I became constipated, but did not report to the surgeon until two days; was then treated; felt better the fourth day, and was all right the fifth day. I was able to perform all duty."

Questioned after termination of trial:

"I lived exclusively on the emergency ration during the five days' trial. It had no effect that I know of on my health and strength. It was more palatable toward the last than at first. It tasted good at the last. I was sick and constipated one day and threw the food up. I became constipated the second day, and remained so until treated by the surgeon. Afterwards I was all right. My physical condition was just the same while living on this ration as it ordinarily is, except the constipation."

Curtis M. Samuel, private, Troop A, Eighth Cavalry.—First year of service. Weight when trial commenced, 163 pounds; when trial ended, 163 pounds; no change. Greatest weight, 163 pounds; least, 160 pounds.

Questioned during trial:

"The ration has satisfied my hunger. It has kept up my strength. I am able to perform all duty. I have felt no ill effects in either stomach or bowels after eating it."

Questioned after termination of trial:

"I lived exclusively on the emergency ration during the five days' trial. It had no effect whatever on my health and strength. It continued palatable all the time I was using it. It never disagreed with me, and I was not sick during the trial. I didn't notice any difference in my physical condition while living on this ration from what it ordinarily is. I felt just the same as usual."

Joseph E. Schuellian, private, Troop A, Eighth Cavalry.—First year of service. Weight when trial commenced, 129½ pounds; when trial ended, 131½ pounds; gain, 2 pounds. Greatest weight, 131½ pounds; least, 128½ pounds.

Questioned during trial:

"The ration has satisfied my hunger. It has kept up my strength. I feel able to perform all duty. I have felt no ill effects in either stomach or bowels after eating it."

Questioned after termination of trial:

"I lived exclusively on the emergency ration during the five days' trial. It had no effect on my health and strength that I know of. It was palatable all the time I was using it. It never disagreed with me, and I was not sick during the trial. My physical condition was about the same as it ordinarily is."

William M. Sellers, private, Troop A, Eighth Cavalry.—First year of service. Weight when trial commenced, 142½ pounds; when trial ended, 142 pounds; loss, one-half pound. Greatest weight, 142½ pounds; least, 137½ pounds.

Questioned during trial:

"The ration has satisfied my hunger; it has kept up my strength. I feel able to perform all duty. I have felt no ill effects after eating it."

Questioned after termination of trial:

"I lived exclusively on the emergency ration during the five days' trial. It had no effect on my health and strength. When the trial was over I felt better than when it commenced. I was feeling badly when we started out. The ration continued palatable all the time. Toward the last I believe it tasted better. It never disagreed with me and I was never sick. My physical condition was about the same as ordinary. My spirits were somewhat depressed."

W. E. Smith, private, Troop A, Eighth Cavalry.—First year of service. Weight when trial commenced, 138 pounds; when trial ended, 136½ pounds; gain, one-half pound. Greatest weight, 137½ pounds; least, 135½ pounds.

Questioned during trial:

"The ration has satisfied my hunger; it has kept up my strength. I feel able to perform all duty. I have felt no ill effects after eating it, except a little headache one day."

Questioned after termination of trial:

"I lived exclusively on the emergency ration during the five days' trial. It had no effect whatever on my health and strength. It was palatable all the time I was eating it. It never disagreed with me and I was not sick. My physical condition was just the same all the way through. I couldn't tell any change; in fact, I feel better now than when I went out."

Adam C. Strole, private, Troop A, Eighth Cavalry.—First year of service. Weight when trial commenced, 143½ pounds; when trial ended, 143 pounds; loss, one-half pound. Greatest weight, 143½ pounds; least, 139 pounds.

Questioned during trial:

"The ration has satisfied my hunger; it has kept up my strength. I feel able to perform all duty. I have felt no ill effects after eating it."

Questioned after termination of trial:

"I lived exclusively on the emergency ration during the five days' trial. It kept up my health and strength, although I felt a little hungry at times. I felt hungry before meals—not right after. The ration continued palatable all the time. It tasted far better at the end than at the start. It never disagreed with me and I was not sick. My physical condition while living on this ration was about the same as ordinary."

John A. Walker, private, Troop A, Eighth Cavalry.—First year of service. Weight when trial commenced, 144½ pounds; when trial ended, 145 pounds; gain, one-half pound. Greatest weight, 145 pounds; least, 142 pounds.

Questioned during trial:

"The ration has satisfied my hunger. It has kept up my strength. I feel able to perform all duty. I have felt no ill effects after eating it."

Questioned after termination of trial:

"I lived exclusively on the emergency ration during the five days' trial. It had no effect on my health or strength. It always tasted good. It never disagreed with me and I was not sick. My physical condition was just the same as ordinary."

Jesse E. L. Yeardsley, private, Troop A, Eighth Cavalry.—First year of service. Weight when trial commenced, 149½ pounds; when trial ended, 147½ pounds; loss, 2 pounds. Greatest weight, 149½ pounds; least, 147½ pounds.

Questioned during trial:

"The ration has satisfied my hunger. It has kept up my strength. I feel able to perform all duty. I have had no ill effects in either stomach or bowels after eating it, but had a headache one day."

Questioned after termination of trial:

"I lived exclusively on the emergency ration during the five days' trial. I didn't feel any different than I did before. It was palatable all the time. It never disagreed with me and I was never sick. My physical condition was just the same as ordinary."

Ben. Clark, interpreter and guide.—In service about forty-two years. Weight when trial commenced, 186 pounds; when trial ended, 187 pounds; gain, 1 pound.

Questioned during trial:

"The ration has satisfied my hunger. It has kept up my strength. I am able to perform all duty. I have felt no ill effects after eating it."

J. J. Thorne, private, Hospital Corps.—Third year of service. Weight when trial commenced, 147 pounds; when trial ended, 146 pounds; loss, 1 pound. Greatest weight, 147 pounds; least, 146 pounds.

Questioned during trial:

"The ration has satisfied my hunger. It has kept up my strength. I feel able to perform all duty. I have felt no ill effects after eating it."

F. H. Alford, civilian teamster.—Weight when trial commenced, 157 pounds; when trial ended, 153½ pounds; loss, 3½ pounds. Greatest weight, 157 pounds; least, 153 pounds.

Questioned during trial:

"The ration has satisfied my hunger. It has kept up my strength. I feel able to perform all duty. I had a diarrhea the second day and cramps in my bowels the third day, but was all right again the fourth day."

J. E. Gallagher, civilian teamster.—Weight when trial commenced, 131 pounds; when trial ended, 132½ pounds; gain, 1½ pounds. Greatest weight, 132½ pounds; least, 130½ pounds.

Questioned during trial:

"The ration has satisfied my hunger. It has kept up my strength. I feel able to perform all duty. I have felt no ill effects after eating the ration."

T. R. McCarron, civilian teamster.—Weight when trial commenced, 129 pounds; when trial ended, 130 pounds; gain, 1 pound. Greatest weight, 130 pounds; least, 125½ pounds.

Questioned during trial:

"The ration has satisfied my hunger. It has kept up my strength, except the second day, when I felt a little weak and seemed tired. The food never disagreed with me, and I was never sick."

B. F. Tyree, civilian teamster (an old soldier).—Weight when trial commenced, 155½ pounds; when trial ended, 155½ pounds; no change. Greatest weight, 155½ pounds; least, 151½ pounds.

Questioned during trial:

"The ration has satisfied my hunger. It has kept up my strength. I feel able to perform all duty. I have felt no ill-effects after eating it."

Report of surgeon after this trial, as follows:

BOARD RATION TEST (No. 1).

Quartermaster Sergeant Gaus sick one day; had lively fever for short time; was constipated; vomited also. Suppository (rectal) and purgative and quinine given. Quickly returned to normal condition.

Private Adams lived on chocolate most of the time, but ate other component on last day. Had very slight fever for short time.

Private Newmann had headache, etc., for several days, and was unable to regularly eat solid ration. Strength kept up fairly well.

J. D. POINDEXTER, U. S. A., Surgeon.

NOVEMBER 13, 1900.

November 14, 1900, a detachment consisting of Capt. S. W. Fountain, Eighth Cavalry; Capt. J. D. Poindexter, assistant surgeon; Capt. F. W. Foster, Fifth Cavalry; Ben. Clarke, guide; 25 enlisted men Troop A, Eighth Cavalry; 1 private Hospital Corps, and 4 civilian teamsters, left Fort Reno for the trial of the standard or No. 2 ration.

Captain Poindexter declined to put himself on the ration, and together with Private Thorne, Hospital Corps, and the civilian teamsters, was excused.

On November 15 the remainder of the command was put on No. 2 ration and kept on it for five days. At the termination of the trial a majority of the detachment were complaining of hunger and weakness, although but three men stated they were unable to perform all duty. The 28 men subsisting on this ration lost 144 pounds during the trial, or a trifle over 5 pounds per man. This could hardly be called an excessive loss, provided the men's health and strength had been kept up, but the loss of strength presents a very grave objection to the exclusive use of this ration for more than a day or so at a time. In the opinion of the board, five days is the extreme limit of time it could safely be employed for the subsistence of troops entirely unprovided with other food with which to eke it out.

The following are the opinions of the various members of the command, expressed in reply to the same series of questions as were propounded in reference to No. 1 ration:

S. W. Fountain, captain, Eighth Cavalry.—Weight when trial commenced, 175½ pounds; when trial ended, 168 pounds; loss, 7½ pounds. Greatest weight, 175½ pounds; least, 168 pounds.

Questioned on third day:

"The ration satisfied my hunger. I performed all duty. The taste of ration does not improve with its use. My stomach has felt uncomfortable, but experienced no serious trouble."

Questioned after termination of trial:

"I lived exclusively on the ration for five days, and experienced no hunger, but I lost weight and strength. The end of the trial did not come any too soon to please me; the taste of the food had begun to pall on me."

F. W. Foster, captain, Fifth Cavalry.—Weight when trial commenced, 165 pounds; when trial ended, 161 pounds; loss, 4 pounds. Greatest weight, 165 pounds; least, 160 pounds.

Questioned on third day:

"The ration has satisfied my hunger. It has kept up my strength. I feel able to perform all duty. I have felt no ill effects from it."

Questioned after termination of trial:

"I walked and hunted several hours every day after getting into camp, as in the previous trial. I never suffered from hunger, and my strength kept up until the fourth day. On that day I was unable to eat all the food, as my stomach had grown tired of it. On that day and the next evening I felt weak and badly. As long as I could eat the food I felt well and strong, although constantly losing weight."

Captain Poindexter did not eat this ration, and consequently was not questioned. He lived on ordinary food during the entire trial.

Ben. Clark, interpreter and guide.—Weight when trial commenced, 186 pounds; when trial ended, 179½ pounds; loss, 6½ pounds. Greatest weight, 186 pounds; least, 179½ pounds.

Questioned on third day:

"The ration has not satisfied my hunger. When made into soup I could eat the whole ration and want more. It has not kept up my strength. I feel weak and feel a little pain in my back. I feel able to perform all duty. I threw up the food the first night, and last night and to-day I have a diarrhea, and could only eat about half the ration."

John Davis, sergeant, Troop A, Eighth Cavalry.—Fourth year of service. Weight when trial commenced, 138 pounds; when trial ended, 131 pounds; loss, 7 pounds. Greatest weight, 138 pounds; least, 131 pounds.

Questioned third day:

"The ration does not satisfy my hunger. I can fill up on it and am satisfied at the time of eating, but in a short time am as weak and hungry as if I hadn't had a meal. It has not kept up my strength. I feel weak, and don't even feel like walking around. I can perform my duty in a way, but not as a soldier should. I don't feel like it. The food is palatable, but after eating a certain amount it goes against one, and it is difficult to eat the balance. I have felt no ill effects in stomach or bowels, except the first night, after eating the food I was sick at my stomach for some time."

Questioned after termination of trial, when command had returned to the post:

"I lived exclusively on the emergency ration during the five days' trial. I got weak and was very hungry most of the time. I could eat the full ration and in an hour would be as hungry as ever. The ration did not continue palatable. After the first two days the first part would taste very well, but the last part would be hard to swallow. The last part of the time my stomach turned against it, and I could hardly eat any of it. The first or second night it made me sick at my stomach, but I did not

throw it up. I was not sick except the time mentioned. While living on this ration I was weak and did not feel able to do my duty as a soldier should."

D Arcey Woodburn-Heron, sergeant, Troop A, Eighth Cavalry.—Third year of service. Weight when trial commenced, 138 pounds; when trial ended, 132 pounds; loss, 6 pounds. Greatest weight, 138 pounds; least, 132 pounds.

Questioned third day:

"The ration has satisfied my hunger. It has not kept up my strength. I feel weak and wish to lie on my bunk all the time. I feel able to perform all duty. At first I felt as if I ate more I would be sick, but now I can eat it all."

Questioned after termination of trial:

"I lived exclusively on the emergency ration during the five days' trial. I didn't have my full strength. The ration continued palatable all the time I was using it. The first two meals I couldn't eat much of it; it had a nauseating effect; afterwards it was all right. I had no sickness during the trial. I didn't have my full strength; was weak all the time."

William M. Hoelt, corporal, Troop A, Eighth Cavalry.—Sixth year of service. Weight when trial commenced, 167 pounds; when trial ended, 160½ pounds; loss, 6½ pounds. Greatest weight, 167 pounds; least, 160½ pounds.

Questioned third day:

"The ration does not satisfy my hunger. Half an hour after eating I am as hungry as ever. It has not kept up my strength. Since yesterday morning I have been so weak I could hardly move. I don't feel like doing anything at all. I am able to perform all duty, but it is hard work. It seems as if my legs wouldn't carry me. I feel more like lying down than anything else. The first day I had nausea and then had diarrhea."

Questioned after termination of trial:

"I lived exclusively on the emergency ration during the five days' trial. My health was as good as usual, but my strength was less. I lost considerable strength. The ration was palatable all the time I was eating it. It made me sick the first night. It nauseated me and I threw it up. I also had a diarrhea the same evening. My physical condition was good, except I was weak from loss of strength."

Frank S. Hagenmiller, corporal, Troop A, Eighth Cavalry.—Fourth year of service. Weight when trial commenced, 137½ pounds; when trial ended, 128½ pounds; loss, 9 pounds. Greatest weight, 137½ pounds; least, 128½ pounds.

Questioned third day:

"The ration has satisfied my hunger. It has kept up my strength. I feel able to do all duty. I have felt no ill effects from eating it."

Questioned after termination of trial:

"I lived exclusively on the emergency ration during the five-days' trial. It has no effect on my health and strength. It continued palatable all the time I was eating it. It never disagreed with me and I was never sick. My physical condition was about the same as ordinary. This ration is more palatable than the first (No. 1), otherwise I noticed no difference."

Fred D. Goodlake, blacksmith, Troop A, Eighth Cavalry.—First year of service. Weight when trial commenced, 120 pounds; when trial ended, 116½ pounds; loss, 3½ pounds. Greatest weight, 120 pounds; least, 116½ pounds.

Questioned third day:

"The ration fills me up so I am not hungry for about an hour. After that I am very hungry. It has not kept up my strength. I am weak all the time. I don't feel like walking, even. Yesterday afternoon in putting up the tents I was so weak I could hardly get around. I don't feel able to perform all duty. I am a blacksmith and I couldn't go into the shop and do a day's work. I have been a little constipated."

Questioned after termination of trial:

"I lived exclusively on the emergency ration during the five days' trial. I was weak and lost weight and didn't feel good. Was otherwise well, except constipated. The ration was palatable all the time I was eating it. It never disagreed with me and I was never sick. My physical condition was not as good as ordinary."

Charles F. Adams, private, Troop A, Eighth Cavalry.—First year of service. Weight when trial commenced, 134½ pounds; when trial ended, 131 pounds; loss, 3½ pounds. Greatest weight, 135 pounds; least, 131 pounds.

Questioned third day:

"The ration has satisfied my hunger. It has kept up my strength. I feel able to perform all duty. I have felt no ill effects after eating it."

Questioned after termination of trial:

"I lived exclusively on the emergency ration during the five days' trial. Toward the last I felt a little weak. The ration was palatable all the time I was using it. It

never disagreed with me and I was never sick. My physical condition was about the same as ordinary.

"I think the first ration (No. 1) was the most strengthening, and I liked it better the longer I used it."

Robert S. Bishop, private, Troop A, Eighth Cavalry.—First year of service. Weight when trial commenced, 161 pounds; when trial ended, 157½ pounds; loss, 3½ pounds. Greatest weight, 161 pounds; least, 157½ pounds.

Questioned third day:

"The ration has satisfied my hunger. It has not kept up my strength. When I got out, stirring around, taking exercise, or putting up tents, I felt weak. I can perform all duty. I have felt no ill effects after eating the ration."

Questioned after termination of trial:

"I lived exclusively on the emergency ration. It made me weak. I couldn't keep my strength up. It was palatable all the time I was using it. It never disagreed with me, except the first meal, when it nauseated me. I was never sick. I felt all right, except I was some weaker."

Charles F. Cardding, private, Troop A, Eighth Cavalry.—First year of service. Weight when trial commenced, 168 pounds; when trial ended, 164 pounds; loss, 4 pounds. Greatest weight, 168 pounds; least, 163 pounds.

Questioned third day:

"The ration has not satisfied my hunger. I am hungry all the time, and really suffer from hunger. I have lost strength. In working, pitching tents, etc., I am weak. I feel able to perform all duty. I have felt no ill effects except that I have had a headache since yesterday morning, but think it comes from doing without coffee."

Questioned after termination of trial:

"I lived exclusively on the emergency ration during the five days' trial. I lost strength, but my health is better than when I went out. I suffered from hunger; there wasn't enough of it for me. It was palatable all the time I was using it. It never disagreed with me. I was bothered with headache, but think it was on account of doing without coffee. I don't drink tea. I was weaker while living on the ration than I am ordinarily."

Floyd Evans, private, Troop A, Eighth Cavalry.—First year of service. Weight when trial commenced, 124 pounds; when trial ended, 118½ pounds; loss, 5½ pounds. Greatest weight, 126 pounds; least, 118½ pounds.

Questioned third day:

"The ration has satisfied my hunger. It has kept up my strength. I feel able to perform all duty. I have felt no ill effects after eating it."

Questioned after termination of trial:

"I lived exclusively on the ration during the five days' trial. It gave me a headache and I felt a little weak. It was palatable all the time I was using it. It never disagreed with me and I was never sick. I feel the same as usual only weaker."

Orville H. Farley, private, Troop A, Eighth Cavalry.—First year of service. Weight when trial commenced, 145 pounds; when trial ended, 139½ pounds; loss, 5½ pounds. Greatest weight, 145 pounds; least, 139½ pounds.

Questioned third day:

"The ration has satisfied my hunger. It has not kept up my strength. I have no ambition, no strength at all. I feel weak all over. I am able to perform all duty. I have felt no ill effects after eating the ration."

Questioned after termination of trial:

"I lived exclusively on the emergency ration during the five days' trial. It made me weak. It was palatable all the time. It never disagreed with me and I was never sick. My physical condition was just the same as ordinary, only I was weak."

"I think this ration tastes better than the first (No. 1), but the latter keeps up your strength better."

Joseph Grucra, private, Troop A, Eighth Cavalry.—First year of service. Weight when trial commenced, 126 pounds; when trial ended, 122 pounds; loss, 4 pounds. Greatest weight, 127 pounds; least, 122 pounds.

Questioned third day:

"The ration does not satisfy me at all. I am unable to eat much of it. Last night I ate some and afterwards had to get up and throw it up, and this morning after breakfast I again threw it up. It has not kept up my strength. I have been so weak I couldn't even put up tents, and only carried tent pins around; and yesterday afternoon couldn't do any thing at all, and lay on my bunk all the afternoon. I don't feel able to do all duty. I have been sick at my stomach, and threw up my food twice. In my opinion the first ration (No. 1) is best."

Questioned after termination of trial:

"I lived exclusively on the emergency ration during the five days' trial. I was sick the last three days and didn't eat anything. The ration was not palatable. The first meal or so it was very good, but after that I couldn't eat more than a spoonful and dropped the rest. I was much better on the first (No. 1) ration."

Nicholas Hinsberger, private, Troop A, Eighth Cavalry.—First year of service. Weight when trial commenced, 122 pounds; when trial ended, 120 pounds; loss, 2 pounds. Greatest weight, 122 pounds; least, 118½ pounds.

Questioned third day:

"The ration has satisfied my hunger. It don't keep up my strength. I feel weak and can't do the work as I ordinarily can. I am able to perform all duty. I have felt no ill effects after eating the ration."

Questioned after termination of trial:

"I lived exclusively on the emergency ration during the five days' trial. The third day I felt a little weak, but was able to do my duty; after that I felt well. The ration was palatable all the time I was using it. It never disagreed with me and I was never sick. My physical condition while living on the ration was about the same as ordinary."

John L. Hobson, private, Troop A, Eighth Cavalry.—First year of service. Weight when trial commenced, 130½ pounds; when trial ended, 128 pounds; loss, 2½ pounds. Greatest weight, 131½ pounds; least, 128 pounds.

Questioned third day:

"I suffered from hunger. I feel bodily weak as if I didn't want to do anything. I feel drowsy. I am able to perform all duty. I have felt no ill effects after eating the ration."

Questioned after termination of trial:

"I lived exclusively on the emergency ration during the five days' trial. It made me weak for the time being. It was palatable all the time I was eating it. It never disagreed with me and I was never sick. I felt good, but weaker than common."

Walter S. James, private, Troop A, Eighth Cavalry.—First year of service. Weight when trial commenced, 139½ pounds; when trial ended, 138 pounds; loss, 1 pound. Greatest weight, 140 pounds; least, 138 pounds.

Questioned third day:

"The food has satisfied my hunger. It has kept up my strength. I feel able to perform all duty. I have felt no ill effects after eating it."

Questioned after termination of trial:

"I lived exclusively on the emergency ration during the five days' trial. I wasn't as strong as when on my regular rations. The ration was palatable all the time I was eating it. It never disagreed with me and I was never sick. I was considerably weaker. I would notice it in the camp work."

Henry C. Lewis, private, Troop A, Eighth Cavalry.—First year of service. Weight when trial commenced, 138 pounds; when trial ended, 131½ pounds; loss, 6½ pounds. Greatest weight, 138 pounds; least, 131½ pounds.

Questioned third day:

"I am not satisfied when my meal is eaten. It has not kept up my strength the way the other (or No. 1) ration did. I feel weak. I don't feel as if I wanted to move at all. I can perform my duty. The ration constipated me so I didn't have a passage for two days. If I had my choice I would rather have the first (No. 1) ration."

Questioned after termination of test:

"I lived exclusively on the emergency ration during the five days' trial. It didn't affect my health, but I didn't have as much strength as I did on the first (No. 1) ration. I didn't care for it at all toward the last. It never disagreed with me and I was not sick. I was all right, except I had no strength."

John F. Martin, private, Troop A, Eighth Cavalry.—First year of service. Weight when trial commenced, 148 pounds; when trial ended, 141½ pounds; loss, 6½ pounds. Greatest weight, 148 pounds; least, 141½ pounds.

Questioned third day:

"The ration does not fully satisfy my hunger. I am satisfied for an hour or so and then am hungry. I feel a little weaker than usual. I can perform all duty. I had a very bad headache all night and could not sleep any. I felt weak this morning and couldn't eat anything."

Questioned after termination of trial:

"I lived exclusively on the ration during the five days' trial. It weakened me a little. As far as my health was concerned I felt as well as ever, except one day, and I don't think the ration did that. The ration was palatable all the time. It never disagreed with me while I was eating it, but I had a headache one night. My physical condition was just the same as ordinary, except I was weak."

John L. Osmont, private, Troop A, Eighth Cavalry.—First year of service. Weight

when trial commenced, 132½ pounds; when trial ended, 126 pounds; loss, 6½ pounds. Greatest weight, 132½ pounds; least, 126 pounds.

Questioned third day:

"The ration has satisfied my hunger. I feel weak when I am doing any work like putting up tents, or anything like that. I feel weak. I am able to perform all duty. I have felt no ill effects after eating the ration."

Questioned after termination of trial:

"I lived exclusively on the emergency ration during the five days' trial. It weakened me a little. It was always palatable. It never disagreed with me and I was never sick. I was weak—that was all."

Claude C. Parks, private, Troop A, Eighth Cavalry.—First year of service. Weight when trial commenced, 135 pounds; when trial ended, 129 pounds; loss, 6 pounds. Greatest weight, 135 pounds; least, 129 pounds.

Questioned third day:

"The ration has satisfied my hunger, but I would like more. This morning, for instance, I could have eaten more than I got, and wanted it. I don't think it has kept up my strength. I don't feel like I did when on full rations. I feel as if I didn't care to move around at all. Just weak. I can perform all duty. I have felt no ill effects after eating the ration."

Questioned after termination of trial:

"I lived exclusively on the emergency ration during the five days' trial. I stood it very well except it made me weak. The ration was palatable except the last meal, which I ate dry. That made me sick at my stomach. I felt a little weak was all I could complain of."

Joseph E. Schullian, private, Troop A, Eighth Cavalry.—First year of service. Weight when trial commenced, 131 pounds; when trial ended, 130 pounds; loss, 1 pound. Greatest weight, 132 pounds; least, 129½ pounds.

Questioned third day:

"The ration has satisfied my hunger. It has kept up my strength. I am able to perform all duty. I have felt no evil effects after eating it."

Questioned after termination of trial:

"I lived exclusively on the emergency ration during the five days' trial. It had no effect on my health and strength. It was palatable all the time. It never disagreed with me, and I was never sick. My physical condition was about the same as ordinary."

William M. Sellars, private, Troop A, Eighth Cavalry.—First year of service. Weight when trial commenced, 142 pounds; when trial ended, 133½ pounds; loss, 8½ pounds. Greatest weight, 142½ pounds; least, 133½ pounds."

Questioned third day:

"The ration has satisfied my hunger. It has kept up my strength. I can perform all duty. I have felt no ill effects after eating it."

Questioned after termination of trial:

"I lived exclusively on the emergency ration during the five days' trial. I was a little weak, otherwise all right. The ration was palatable all the time. It never disagreed with me, and I was never sick. I felt weaker than when on ordinary rations."

William E. Smith, private, Troop A, Eighth Cavalry.—First year of service. Weight when trial commenced, 140 pounds; when trial ended, 133 pounds; loss, 7 pounds. Greatest weight, 140 pounds; least, 133 pounds.

Questioned third day:

"The ration has satisfied my hunger. I have felt weak. When I lie down I feel as if I didn't want to get up. I am now on sick report. I am constipated. This ration tastes better than the first one (No. 1)."

Questioned after termination of trial:

"I lived exclusively on the emergency ration during the five days' trial. I could feel that it was weakening me some. I felt all right. It did not continue palatable. At first it tasted well, but after the third day I could hardly eat it. It disagreed with me; once or twice I came near vomiting when I ate it. I was sick one day with constipation. My physical condition was not as good as ordinary. I was in better condition the first trip (on No. 1 ration) than on this one."

Adam G. Strole, private, Troop A, Eighth Cavalry.—First year of service. Weight when trial commenced, 146 pounds; when trial ended, 139 pounds; loss, 7 pounds. Greatest weight, 146 pounds; least, 139 pounds.

Questioned third day:

"The ration has satisfied my hunger. It has kept up my strength. I can perform all duty. I have had no ill effects after eating it. I think it tastes a little better than the first (No. 1) ration, but think the latter would go farther in the end."

Questioned after termination of trial:

"I lived exclusively on the emergency ration during the five days' trial. It didn't affect me in any way. It never disagreed with me, and I was never sick. My physical condition was about the same as ordinary. I did not get as hungry on the first (No. 1) ration as on this one."

John A. Walker, private, Troop A, Eighth Cavalry.—First year of service. Weight when trial commenced, 144 pounds; when trial ended, 139½ pounds; loss, 4½ pounds. Greatest weight, 144 pounds; least, 139½ pounds.

Questioned third day:

"I suffer from hunger. After eating my meal I am still hungry, and water will not fill me up. I feel tired and lazy all the time; don't feel like myself at all. I felt much better on the first (No. 1) ration. This one tastes a little better, but I felt better on the other one. I don't feel able to perform all duty, but could do it, probably. I have felt no ill effects in stomach or bowels after eating the ration."

Questioned after termination of trial:

"I lived exclusively on the ration during the five days' trial. I felt weak, but my health was all right. It was palatable all the time. It never disagreed with me, and I was never sick. I felt weak and tired. With the first ration (No. 1) I was not so hungry and did not feel so weak, although this one tasted better."

William H. Willey, private, Troop A, Eighth Cavalry.—First year of service. Weight when trial commenced, 142 pounds; when trial ended, 136 pounds; loss 6 pounds. Greatest weight, 142 pounds; least, 136 pounds.

Questioned third day:

"The ration has satisfied my hunger. It has kept up my strength. I can perform all duty. I had a headache and was sick at my stomach the first day and threw up my food. The surgeon gave me physic the next day, and I have had no more trouble."

Questioned after termination of trial:

"I lived exclusively on the ration during the five days' trial. It just weakened me a little, that is all. It was palatable all the time. I had a sick headache the first day. My physical condition when living on the ration was about the same as ordinary."

Report of surgeon after this trial as follows:

Passaic ration test, November 15 to 20, 1900.

Commenced at supper, November 15; lasted five days.

November 18, Privates Crucza, Smith, and Martin excused from the ride to-day. Crucza has slight malarial fever, Smith constipation, and Martin loss of appetite. All kept on the ration, however. Martin and Smith returned to duty in evening, and Crucza to full duty early on 20th. Nobody sick on the march home, but Crucza kept a little fever and entered hospital next day. Fever not caused by ration.

J. D. POINDEXTER, U. S. A., Surgeon.

FORT RENO, OKLA., December 10, 1900.

November 22, a detachment, consisting of Capt. S. W. Fountain, Eighth Cavalry; Capt. J. D. Poindexter, assistant surgeon; Capt. F. W. Foster, Fifth Cavalry; Ben. Clark, guide; 25 enlisted men, troop A, Eighth Cavalry; 1 private, Hospital Corps, and 4 civilian teamsters, left Fort Reno for the trial of the Armour & Co., or No. 3, ration.

Captain Poindexter declined to put himself on the ration, and together with Private Thorne, Hospital Corps, and 4 civilian teamsters, was excused.

On November 23 the remainder of the command was put on No. 3 ration, and kept on it for five days.

During this trial nearly everyone subsisting on the ration suffered excessively from hunger, and a number of the men became so demoralized through this cause as to make no effort whatever to observe the order to eat no other food than the ration, but commenced almost from the start to eke out the ration by surreptitiously obtaining and parching corn, while some also succeeded in obtaining other food from camping parties, etc., whose vicinity we were not always able to avoid.

Notwithstanding this, the greater part of the men were reduced to a pitiable state of weakness, and the surgeon was obliged to put 8 men on ordinary rations before the trial was concluded.

This ration is unsuited for its purpose in any case, as it is only to be eaten after further cooking, while one of the requisites of an emergency ration is that it can be eaten dry as it comes from the can; besides, it is entirely inadequate in any case, and in the

opinion of the board can not safely be employed for the subsistence of troops without the assistance of other food under any circumstances.

The following are the opinions of the various members of the command expressed in reply to the same series of questions as were propounded in reference to Nos. 1 and 2:

S. W. Fountain, captain, Eighth Cavalry.—Weight when trial commenced, 170 pounds; when trial ended, 166½ pounds; loss, 3½ pounds. Greatest weight, 170 pounds; least, 166½ pounds.

Questioned after termination of trial:

"I lived exclusively on this ration for the five days and found it palatable all the time; but it did not satisfy my hunger and it did not keep up my strength. I ate all the ration at each meal and still remained hungry, going to bed hungry each night. It was only by forced determination that I was able to abstain from other food. I remained well."

F. W. Foster, captain, Fifth Cavalry.—Weight, when trial commenced, 161 pounds; when trial ended, 158 pounds; loss, 3 pounds. Greatest weight, 161 pounds; least, 157½ pounds.

Questioned on third day:

"Tastes very well in soup or hash. Satisfies hunger but does not keep up strength. I am getting weaker daily."

Questioned after termination of trial:

"On third day my bowels were loose, with two passages. On fourth day had slight diarrhea. This grew worse on the fifth day, and attributed it to the food. I substituted for the last meal a portion of No. 1 ration. I lost strength daily while living on this ration."

Captain Poindexter did not eat this ration, but subsisted on ordinary food during the entire trial.

William M. Gaus, sergeant, Troop A, Eighth Cavalry.—Twelfth year of service. Weight when trial commenced, 148 pounds; when trial ended, 149 pounds; gain, 1 pound. Greatest weight, 150 pounds; least, 147 pounds.

Questioned on third day:

"The ration has not quite satisfied my hunger. It has kept up my strength. I am able to perform all duty. I have felt no ill effects after eating the ration."

Questioned after termination of trial:

"I ate nothing else than the ration during the five days' trial. It had no effect whatever on my health and strength. I was just as healthy and just as strong. It was palatable all the time. It never disagreed with me and I was never sick. My physical condition was just the same as ordinary."

"I think I could do better on the first ration (No. 1); that I could stand it longer, although the third one (No. 3) is more palatable."

Herman Weinmann, sergeant, Troop A, Eighth Cavalry.—Twentieth year of service. Weight when trial commenced, 136 pounds; when trial ended, 135 pounds; loss, 1 pound. Greatest weight, 138 pounds; least, 135 pounds.

Questioned on third day:

"The ration is not enough to satisfy my hunger. It has kept up my strength. I am able to perform all duty. I have felt no ill effects after eating it."

Questioned after termination of trial:

"I ate nothing else than the ration during the five days' trial. It had no effect on me except the last day, when I had a sick headache. It was palatable all the time. It never disagreed with me, and I was only sick as before stated. My physical condition was just about the same as ordinary."

"I would consider the first ration (No. 1) the best. This one (No. 3) is greasy. If I had my choice I would take the first. I would be willing to put five of No. 1 in my saddle pockets and start on a five days' trip at any time if it was necessary."

Otto C. Langfeld, corporal, Troop A, Eighth Cavalry.—Fifth year of service. Weight when trial commenced, 142½ pounds; when trial ended, 144 pounds; gain, 1½ pounds. Greatest weight, 144 pounds; least, 142 pounds.

Questioned on third day:

"The ration satisfies me at the time, but I get hungry in a couple of hours after. I feel weak in my knees ever since I have been living on it. I can perform all duty. I have felt no ill effects after eating it."

Questioned after termination of trial:

"I have eaten nothing else than the ration during the five days' trial. I felt weak at the knees. Since I got in I have this no longer. The ration was palatable. It never disagreed with me, and I was never sick. I was weak. I felt better when eating the first ration (No. 1) than this one (No. 3)."

Lewis Wanterlick, corporal, Troop A, Eighth Cavalry.—Fifteenth year of service. Weight when trial commenced, 145 pounds; when trial ended, 145½ pounds; gain, one-half pound. Greatest weight, 146 pounds; least, 144 pounds.

Questioned on third day:

"The ration satisfied my hunger for the time being, but in an hour I feel hungry again. It has not kept up my strength. I feel weak in my arms and generally. I am not as strong as usual. I feel able to perform all duty for a certain length of time. I have felt no ill effects after eating the ration."

Questioned after termination of trial:

"I ate nothing else than the ration during the five days' trial. It had no effect on my health, but made me a little weak. It was palatable except in soup. It never disagreed with me, and I was never sick. My physical condition was about the same as ordinary, except a little weak."

Alfred B. Stedman, corporal, Troop A, Eighth Cavalry.—Fifth year of service. Weight when trial commenced, 122½ pounds; when trial ended, 125 pounds.

Questioned on third day:

"It has not satisfied my hunger. It does for the time being, but does not last like the first one (No. 1) did. It has kept up my strength. I am able to perform all duty. I have felt no ill effects after eating it."

Questioned after termination of trial:

"In addition to the ration I ate some raw corn. I also ate ordinary food when on detached service November 24. I know that other men also ate extra food. Quite a number ate parched corn, and a number ate bread. When we were camped at Sugar Creek one man exchanged tobacco with some hunters for biscuits. The ration had no effect on my health. It reduced my strength somewhat. It continued palatable. It never disagreed with me, and I was never sick. My physical condition was just the same as ordinary, except I was weaker. I saw corn parched in the stove in my tent twice. Another time I saw men eating parched corn, but did not see them parch it. I consider the first ration (No. 1) better than this (No. 3). There seemed to be more of it and it seemed to keep up my strength better."

Alfred B. Russell, cook, Troop A, Eighth Cavalry.—First year of service. Weight when trial commenced, 160 pounds; when trial ended, 160 pounds; no change. Greatest weight, 164½ pounds; least, 160 pounds.

Questioned on third day:

"It satisfied my hunger for the time being, but in an hour after eating it I have a craving in my stomach; a gnawing feeling. It has kept up my strength. I am able to perform all duty. I have felt no ill effects after eating the ration."

Questioned after termination of trial:

"I ate nothing else than the ration during the five days' trial. I felt much better while eating it. The last two days it began to get so I couldn't eat it. It never disagreed with me. I was constipated for the first three days. My physical condition was just about the same as usual."

Edward L. Ford, trumpeter, Troop A, Eighth Cavalry.—First year of service. Weight when trial commenced, 133½ pounds; when trial ended, 131½ pounds; loss, 2 pounds. Greatest weight, 134 pounds; least, 131½ pounds.

Questioned on third day:

"The ration has satisfied my hunger for a little while after eating it, but in about two hours I become hungry again. It has not kept up my strength. I can feel it in my back and legs. I am able to perform all duty. I have been constipated."

This man was taken off emergency ration, put on sick report and ordinary rations by order of the surgeon November 27. The fourth day of the trial. Report of surgeon stated: "Suffering essentially from lack of sufficient food."

Questioned after termination of trial:

"I ate other food than the emergency ration during the five days' trial. I was put on sick report and had ordinary food the evening of November 27. I also ate some parched corn that morning. The ration made me weak in my limbs and body, and I was hungry all the time. The ration was palatable. It did not disagree with me while I was eating it, but my stomach seemed to bother me a little and I was constipated. I didn't feel as good as on full rations."

Jacob Alt, private, Troop A, Eighth Cavalry.—First year of service. Weight when trial commenced, 152½ pounds; weight when taken off ration and put on sick report, November 26, 150 pounds; loss, 2½ pounds.

Questioned on third day:

"The ration does not satisfy my hunger at all. It has not kept up my strength. I could hardly stand up. I am not able to perform all duty. I have felt no ill effects in stomach or bowels after eating it."

This man was put on sick report and given full rations November 26. Surgeon

reports: "Private Alt unable to eat ration. He ate a lot of miserably-cooked biscuits surreptitiously the night before. Possibly such caused the stomach trouble. He ate ordinary food balance of trip."

Questioned after termination of trial:

"In addition to the ration I ate some flour and water cooked together at camp on Sugar Creek. Was put on sick report the next day and had full rations. The ration weakened me, is all. It was palatable, all but the last meal. It never disagreed with me. I got weak, and thought if I ate any more of it I would get sick."

George B. Bishop, private, Troop A, Eighth Cavalry.—First year of service. Weight when trial commenced, 172 pounds; when trial ended, 172 pounds; no change. Greatest weight, 173 pounds; least, 170 pounds.

Questioned on third day:

"The ration has not satisfied my hunger. I am hungry after eating. It has not kept up my strength. Whenever I start to walk I feel weak. I don't feel like doing anything. I am able to perform all duty. I am constipated."

Questioned after termination of trial:

"I ate other food during the five days' trial. I ate some parched corn and some bread the morning we came home. I ate parched corn the second and third days we were on the ration. I felt weak from the time I commenced eating the ration. I didn't feel like doing duty; felt badly. I wanted to be sitting down all the time; didn't feel like working. The ration was palatable. It never disagreed with me, but I was constipated and had no movement until I took some physic. My physical condition was not as good as ordinary."

William J. Brodie, private, Troop A, Eighth Cavalry.—First year of service. Weight when trial commenced, 154½ pounds; when trial ended, 152 pounds; loss, 2½ pounds.

Questioned on third day of trial:

"The ration has not satisfied my hunger. It has not kept up my strength. I feel weak in the stomach and weak all over. I am hardly able to perform duty. I hadn't enough strength to do anything. I have felt no ill effects in stomach or bowels after eating it."

This man was put on the sick report and given full rations November 27 by direction of the surgeon, who reported him as "suffering essentially from lack of sufficient food."

Questioned after termination of trial:

"In addition to the emergency ration I ate some parched corn and was put on full rations November 27. The ration weakened my system and made me feel weak and drowsy all the time. It was palatable and never disagreed with me, but I was constipated. Weakness was all the difference in my physical condition from what it ordinarily is."

Archie Coffie, private, Troop A, Eighth Cavalry.—First year of service. Weight when trial commenced, 157 pounds; when trial ended, 155½ pounds; loss 1½ pounds. Greatest weight, 157 pounds; least, 154½ pounds.

Questioned on third day:

"The ration has not satisfied my hunger. It has not kept up my strength. I feel very weak all the time and keep getting weaker. I am able to perform all duty. I have had a pain in my bowels for the last two days."

Questioned after termination of trial:

"In addition to the ration I ate some parched corn and a piece of biscuit. I also ate a piece of hard bread the last day as we were coming along the road. My strength seemed to fail. My health was good. The ration was palatable. It never disagreed with me and I was never sick. I was weaker than ordinary."

Benjamin A. Featherson, private, Troop A, Eighth Cavalry.—First year of service. Weight when trial commenced, 136 pounds; when trial ended, 136 pounds; no change. Greatest weight, 137½ pounds; least, 136 pounds.

Questioned on third day:

"The ration has satisfied my hunger. I feel indisposed and weak. I don't feel that I have any life at all. I can perform all duty. I have felt no ill effects in stomach or bowels after eating the ration."

This man was put on sick report and given full rations November 27 by order of the surgeon, who reported him as "suffering essentially from lack of sufficient food."

Questioned after termination of trial:

"In addition to the ration I ate some corn not less than three times, and the last day I was on full rations. The ration made me weak. It didn't seem to nourish me. It was not palatable. At first it tasted good but toward the last it didn't seem to have any taste at all. I reported to the surgeon on the evening of November 27 that I was weak and he put me on full rations. I was weaker than ordinary, and didn't feel like doing anything except lie around."

Alexander Fletcher, private, Troop A, Eighth Cavalry.—First year of service. Weight when trial commenced, 133 pounds; when trial ended, 131½ pounds; loss 1½ pounds. Greatest weight, 133½ pounds; least, 131 pounds.

Questioned on third day:

"The ration has satisfied my hunger. It has not kept up my strength. I am weak in the legs and all over when I try to lift anything, and feel drowsy as if I would like to lie down. I don't want to walk around. I am able to perform light duty, but not very heavy duty."

Questioned after termination of trial:

"Besides the emergency ration I ate some parched corn. The ration made me terribly weak. It was palatable. It never disagreed with me and I was never sick. My physical condition was worse than ordinary."

Jeremiah Foltz, private, Troop A, Eighth Cavalry.—First year of service. Weight when trial commenced, 144 pounds; when trial ended, 140½ pounds; loss, 3½ pounds. Greatest weight, 144 pounds; least, 140½ pounds.

Questioned on third day:

"The ration does not satisfy my hunger. I am hungry shortly after eating it. It has not kept up my strength. I am weak in putting up tents and such work. I am kind of nervous. I could not perform heavy duty. I am constipated."

Questioned after termination of trial:

"I have eaten nothing but the emergency ration during the five days' trial. It made me a little weak. It was palatable. It never disagreed with me and I was never sick. My physical condition was about the same as ordinary except a little bit weak."

Joseph E. Gastineau, private, Troop A, Eighth Cavalry.—Fourth year of service. Weight when trial commenced, 164 pounds; when trial ended, 164 pounds; no change. Greatest weight, 164 pounds; least, 163½ pounds.

Questioned on third day:

"The ration satisfies my hunger for about an hour and a half or two hours after eating. I am a little weak. My strength is not as great as when we started. I am able to perform all duty. I have felt no ill effects after eating the ration."

Questioned after termination of trial:

"In addition to the ration I had a supper when on detached service after horses, and ate some parched corn on Sugar Creek. I was a little weaker than ordinary. The ration was palatable. It never disagreed with me and I was never sick. I was a little weaker than ordinary."

Charles Crossman, private, Troop A, Eighth Cavalry.—First year of service. Weight when trial commenced, 119½ pounds; when trial ended, 121 pounds; gain, 1½ pounds. Greatest weight, 121 pounds; least, 118 pounds.

Questioned on third day:

"The ration has not satisfied my hunger. I don't seem to have enough of it. It has not kept up my strength. I am weak and can't do my work as well as when I started. I am able to perform all duty. I have felt no ill effects after eating the ration."

This man was put on sick report and given full rations November 27 by order of the surgeon, who reported him as "suffering essentially from lack of sufficient food."

Crossman then stated:

"My stomach is out of order. Food makes me sick even to smell of it. Am constipated and very weak."

Questioned after termination of trial:

"In addition to the ration I ate parched corn, and was put on sick report November 27 and then had full rations. The ration made me weak. The ration did not remain palatable. It tasted good at first, but I threw it up at the last meal. I had a constant headache and was constipated. My physical condition was worse than ordinary."

Charles M. Hancock, private, Troop A, Eighth Cavalry.—First year of service. Weight when trial commenced, 135 pounds; when trial ended, 135 pounds; no change. Greatest weight, 136 pounds; least, 134 pounds.

Questioned on third day:

"The ration satisfied my hunger. It kept up my strength very well. I feel slightly weak in the legs only. I am able to perform all duty. I have felt no ill effects after eating the ration."

Questioned after termination of trial:

"In addition to the ration I ate some parched corn. The ration made me weaker. It was palatable, but not as good at the last as at first. It never disagreed with me and I was never sick. My physical condition was as usual, except a little weaker."

William Hein, private, Troop A, Eighth Cavalry.—First year of service. Weight when trial commenced, 122 pounds; when trial ended, 121½ pounds; loss, ½ pound. Greatest weight, 122 pounds; least, 121½ pounds.

Questioned on third day:

"The ration did not satisfy my hunger. I could eat more. It does not keep up my strength. I am weak in the legs. When I walk my legs give way. I am able to perform all duty. I am constipated."

This man was put on sick report and given full rations November 27 by order of the surgeon, who reported him "suffering essentially from lack of sufficient food."

Questioned after termination of trial:

"In addition to the emergency ration I ate some parched corn, and was put on full rations November 27. The ration made me weak and constipated. It was palatable and did not disagree with me. I reported to the surgeon that I was weak and constipated and was put on full rations. I didn't feel as good as ordinary."

Harry B. Hitt, private, Troop A, Eighth Cavalry.—First year of service. Weight when trial commenced, 122 pounds; when trial ended, 120 pounds; loss, 2 pounds. Greatest weight, 122 pounds; least, 119 pounds.

Questioned on third day:

"When I eat the ration I am satisfied for about half an hour, I then get as hungry as ever. It has not kept up my strength. If I work a little while I get out of wind, and my legs don't seem able to hold me up. I can perform all my duty, although I am hardly able. I have had no ill effects in stomach or bowels after eating it."

This man was put on sick report and given full rations November 27 by order of the surgeon, who reported him as having diarrhea.

Hitt, himself, stated:

"I feel badly. Stomach is out of order. Bowels move every twenty minutes like water. Have had two chills. Appetite never satisfied."

Questioned after termination of trial:

"In addition to the emergency ration I had the meal I ate on November 24, when on detached service after horses, and some parched corn. I ate the corn at the camp on Boggy. The ration gave me diarrhea and my strength gave out. I got weak and could not work long in putting up tents or similar work. It was not palatable. It tasted good the first day or so, after that I had to drink water so I could swallow it. My stomach refused it. I threw it up once. I had headache and chills and fever. I also had diarrhea. My physical condition was not as good as ordinary."

John J. Hopper, private, Troop A, Eighth Cavalry.—First year of service. Weight when trial commenced, 140 pounds; when trial ended, 139 pounds; loss, 1 pound. Greatest weight, 141 pounds; least, 138 pounds.

Questioned on third day:

"I get hungry in about half an hour after eating the ration. It does not keep up my strength. I am weak in the knees when working or lifting. I can't mount my horse very well. I am weak in the arms. I am able to perform all duty. I am sick at my stomach after eating."

Questioned after termination of trial:

"I ate other food than the ration during the trial. I ate some parched corn at the camp on Boggy; some cakes at the camp on Sugar Creek; also a piece of cheese the first night. The ration made me weak, and I didn't like it. It did not disagree with me, and I was never sick. I was weaker than ordinary."

John B. McCord, private, Troop A, Eighth Cavalry.—First year of service. Weight when trial commenced, 145 pounds; when trial ended, 142 pounds; loss, 3 pounds. Greatest weight, 145 pounds; least, 142 pounds.

Questioned on third day:

"The ration does not satisfy my hunger. I am hungry all the time. It does not keep up my strength. I feel weak after working a little. I feel weak all over. I can perform all duty. I have felt no ill effects after eating the ration."

This man was put on sick report and given full rations November 27, by direction of the surgeon, who reported him as "suffering essentially from lack of sufficient food."

Earl Price, private, Troop A, Eighth Cavalry.—First year of service. Weight when trial commenced, 148 pounds; when trial ended, 148 pounds; no change. Greatest weight, 150½ pounds; least, 147½ pounds.

Questioned on third day:

"The ration satisfies my hunger while I am eating it and for an hour afterwards. It has not kept up my strength. I feel weak, and if I work a little I feel as if I would give way in the knees. I don't feel able to perform all duty. I have felt no ill effects after eating the ration."

Questioned after termination of trial:

"In addition to the ration I ate two cans of potted ham. I also ate a handful of parched corn. I ate the ham from day to day, and the corn at the camp on Boggy. Some of the boys brought it from the Indian village. It was unparched and we

parched it in the stove in the tent of the Third squad. There were other men parching corn at the same time. I would not be hungry for an hour to an hour and a half after eating the ration; I would then be as hungry as if I hadn't eaten anything. After three or four meals after we went out I became weak. I felt drowsy and as if I didn't want to move around. The ration did not continue palatable. It tasted very well the first three or four meals; after that I didn't like the taste of it. It never disagreed with me, but I had diarrhoea the last two days we were out. I was not as strong as usual while living on this ration."

Harlan D. Rutherford, private, Troop A, Eighth Cavalry.—First year of service. Weight when trial commenced, 128½ pounds; when trial ended, 126 pounds; loss, 2½ pounds. Greatest weight, 128½ pounds; least, 126 pounds.

Questioned on third day:

"The ration has satisfied my hunger. It has not kept up my strength. An hour or so after eating I feel weak all over. I can do all duty. I have felt no ill effects after eating the ration."

After termination of trial:

"In addition to the ration I ate some flour at the camp on Sugar Creek. My health was all right, but it weakened me in an hour after eating. The ration was palatable. It never disagreed with me and I was never sick. I was weaker than ordinary."

John B. Whitt, private, Troop A, Eighth Cavalry.—First year of service. Weight when trial commenced, 134 pounds; when trial ended, 132 pounds; loss, 2 pounds. Greatest weight, 134 pounds; least, 132 pounds.

Questioned on third day:

"The ration does not satisfy my hunger. In two hours after eating I am as hungry as ever. I am weaker than when I left the post. I notice it when walking and also when riding."

Questioned after termination of trial:

"In addition to the ration I ate some parched corn. My health was all right, but it made me weak. It was palatable. It never disagreed with me and I was never sick. I was weaker than ordinary."

Thomas J. Zimmerman, private, Troop A, Eighth Cavalry.—First year of service. Weight when trial commenced, 152 pounds; when trial ended, 151 pounds; loss, 1 pound. Greatest weight, 155 pounds; least, 149 pounds.

Questioned on third day:

"I am as hungry two hours after eating as if I hadn't had anything to eat. Whenever I am doing any work I can feel that my arms are weak. I notice it, also, in walking and riding."

Questioned after termination of trial:

"In addition to the ration I ate some parched corn at the camp on Sugar Creek. I also started to eat something else, and saw Captain Fountain coming and threw it away. The ration kept me weak all the time and I was hungry all the time. It was palatable. It never disagreed with me and I was never sick. I felt hungry and weaker than ordinary."

Report of surgeon after this trial, as follows:

Chicago ration test, November 23 to 28, 1900.

Commenced at supper, November 23; lasted five days.

November 26: Private Alt unable to eat ration. He ate a lot of miserably cooked biscuits surreptitiously the night before; possibly such caused the stomach trouble. He ate ordinary food balance of trip.

November 27—4.30 p. m.: Excused Privates Hein, Hitt, Brodie, Crossman, McCord, and Featherson, and Trumpeter Ford from living on emergency ration any longer, but they stayed on duty, as did Alt also. Hitt had diarrhoea. The others were merely suffering essentially from lack of sufficient food. Crossman and Ford took laxatives.

J. D. POINDEXTER, U. S. A., Surgeon.

FORT RENO, OKLA., December 10, 1900.

The results of the three trials having demonstrated to the satisfaction of the board that No. 1 best fulfilled the requisites of an emergency ration, arrangements were at once made for the fourth or final trial, as outlined in the original plan.

The commanding officer of Fort Sill, Okla., having promised a detachment of 25 men for this trial, he was now communicated with and requested to have this detachment leave his post December 1, march to Anadarko, Okla., and there join the detachment which was to leave Fort Reno on the same date.

The combined force, consisting of Capt. S. W. Fountain, Eighth Cavalry, Capt. F. W. Foster, Fifth Cavalry, Ben. Clark, guide, 25 enlisted men, Troop A, and 26 enlisted men, Troop C, Eighth Cavalry, 1 private, of Hospital Corps, and 5 civilian teamsters left Anadarko December 3.

Captain Poindexter did not accompany this command, as he was suffering from indisposition. Private Thorne, Hospital Corps, was hereon supplied with a stock of medicines and administered them as required.

The entire command was put on No. 1 ration as soon as all the arrangements for the march were made.

Before starting out the object of the trial was carefully explained to the men and they were asked to report to the commanding officer in case they felt at any time that the ration was insufficient, being told that in such case they would at once be put on ordinary rations. Every man subsisting on the ration was weighed in his ordinary clothing previous to starting out, but no further weights were taken during the trial and no attempt was made at the examination and questioning that had been practiced during the three preceding trials.

This trial not being for the purpose of comparing this ration with any other, but simply to ascertain in what condition for service a cavalry command would be after subsisting on it during a five days' march or campaign, no such minuteness was considered necessary.

The route was so laid out as to make each day's march approximately 20 miles, and instead of making camp before the midday meal, as in the previous trials, care was taken to halt daily about noon for luncheon, which for this meal consisted of the ration dry as it came from the can, washed down by water only. Camp was made sometime during the afternoon, all the necessary work, such as pitching tents, gathering wood, etc., being performed before the evening meal was served. All guard duty, including herding the stock, was regularly performed; in short, every effort was made to assimilate the march in all respects to the ordinary march of a troop of cavalry.

The trial ended December 7, when the command reached Fort Reno, Okla. The weights of the men were again taken on that day under the same conditions as at the beginning of the trial, and the actual loss in weight of the 56 men subsisting on the ration was 6 pounds, as shown by the combined weights of the men at the beginning and the end of the trial. There is probably some error in this result, due to the fact that all the men were not careful to wear exactly the same clothing when both sets of weights were taken, resulting in some cases to an apparent abnormal gain, and in others to a corresponding loss; but making all allowance for such errors, it is probable that the same command subsisting on ordinary field rations under similar circumstances would have shown an equal or greater loss in weight.

The result of this trial was to confirm the members of the board in their favorable opinion of No. 1 ration.

At no time during the trip was there the slightest indication in the appearance of any man that he was suffering from hunger or weakness, and Private Thorne, Hospital Corps, in charge of the medical stores, reported that no men had been treated for any illness that could be attributed to the ration.

This was a much severer test than any of the rations had been subjected to during the first series of trials, and the results were so very favorable that the board feels warranted in asserting that any command can go into a campaign and subsist exclusively on this ration for ten or more days at a time, if necessary, with the absolute assurance of being fit for service at all times.

The following are the opinions of the various members of the command, expressed in answer to the following set of questions propounded after the termination of the trial:

Did you eat the ration during the five days?

Did you eat anything else than the ration?

Was it palatable?

What effect did it have on your health and strength?

S. W. Fountain, captain, Eighth Cavalry.—Weight when trial commenced, 180 pounds; when trial ended, 175 pounds; loss, 5 pounds. These weights were with usual clothing.

"I lived exclusively on this ration for five days. This was the second trial of this ration. I found it palatable all the time. I ate the food in a thick soup or mush, morning and evening, using the chocolate in liquid—about one pint. At noon I ate the food stuff and chocolate dry, drinking cold water from my canteen. I remained perfectly well in every respect. Of the three rations I tested I should, from my own experience, consider this one vastly superior to the other two."

F. W. Foster, captain, Fifth Cavalry.—Weight when trial commenced, 169 pounds; when trial ended, 167½ pounds; loss 1½ pounds.

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The combined force, consisting of Capt. S. W. Fountain, E. W. Foster, Fifth Cavalry, Ben. Clark, guide, 25 enlisted men, Troop C, Eighth Cavalry, 1 private, of Hospital teamsters left Anadarko December 3.

Captain Poindexter did not accompany this command, as he was indisposed. Private Thorne, Hospital Corps, was here, and he gave medicines and administered them as required.

The entire command was put on No. 1 ration as soon as the marches were made.

Before starting out the object of the trial was carefully explained to the prisoners. They were asked to report to the commanding officer in the morning whether they were satisfied with the ration. It was explained that the ration was insufficient, being told that in such cases the men were to be put on ordinary rations. Every man subsisting on the ration was to be given ordinary clothing previous to starting out, but no further explanation was given. The trial and no attempt was made at the examination and the trial was practiced during the three preceding trials.

This trial not being for the purpose of comparing the two, but simply to ascertain in what condition for service a cavalryman subsisting on it during a five days' march or campaign, is considered necessary.

The route was so laid out as to make each day's march instead of making camp before the midday meal. It was taken to halt daily about noon for luncheon, which was ration dry as it came from the can, washed down by the sometimes during the afternoon, all the necessary work being done, being performed before the evening. The duty, including herding the stock, was regular. Weight was made to assimilate the march in all respects. Change.

The trial ended December 7, when the ~~weights~~ was palatable. The weights of the men were again taken ~~at the beginning of the trial, and the actual loss~~ service. Weight on the ration was 6 pounds, as shown by the ~~weights~~; loss, 1 pound. beginning and the end of the trial. ~~There is no~~ It was palatable. I to the fact that all the men were not ~~convinced~~ Second year of service. Both sets of weights were taken, resulting in ~~loss~~ added, 142 pounds; gain, 2 and in others to a corresponding ~~loss~~ probable that the same command ~~was~~

The result of this trial was to establish the opinion of No. 1 ration.

At no time during the trip was there any man that he was suffering from the Corps, in charge of the

the five days. It was palatable, but I
health was all right, but I felt a little

with Caraley.—First year of service. Weight when trial ended, 145½ pounds; loss, 1½ pounds. The following are the

...during the five days. The first two meals I
I could eat all I could get. It had no effect at all
I could notice."

Troop C, Eighth Cavalry.—Second year of service. At start, 155 pounds; when trial ended, 155½ pounds; gain,

...ve five days. It was palatable when

5th Cavalry.—First year of service. when trial ended, 154 pounds; gain, 4

During the five days. It was palatable. I
an before."

"I ate the ration and nothing else during the five days. It was always palatable. It had no effect whatever on my health and strength. I have lived on No. 1, No. 2, and No. 3 rations, and consider No. 1 far superior to the others in every respect."

Henry C. Lenhardt, sergeant, Troop C, Eighth Cavalry.—Ninth year of service. Weight when trial commenced, 144 pounds; when trial ended, 143½ pounds; loss, one-half pound.

Questioned after the march was concluded:

"I ate the ration and nothing else during the five days' trial. I liked it very much. It tasted better at the end of the time than at the commencement. I lost no strength and was in good health. I could see no change in me, and believe I could live on it a month without eating anything else. Its effect on my health and strength was good."

James E. Ayers, corporal, Troop C, Eighth Cavalry.—Third year of service. Weight when trial commenced, 137½ pounds; when trial ended, 144 pounds; gain, 6½ pounds.

Questioned after the march was concluded:

"I ate the ration and nothing else during the five days' trial. It was palatable. My health was better than usual. I felt better then and do now. My strength was even greater than usual. The change or something else seemed to do me good. I think I could go twenty days on the ration as well as I could five."

Colonel Charleston, corporal, Troop C, Eighth Cavalry.—Second year of service. Weight when trial commenced, 166 pounds; when trial ended, 170 pounds; gain, 4 pounds.

Questioned after the march was concluded:

"I ate the ration and nothing else during the five days' trial. It was palatable. My health and strength were just as usual."

Harry Richards, blacksmith, Troop C, Eighth Cavalry.—First year of service. Weight when trial commenced, 141 pounds; when trial ended, 144 pounds; gain, 3 pounds.

Questioned after the march was concluded:

"I ate the ration and nothing else during the five days' trial. It was palatable. I felt all right but a little weak the last two days, but could do my duty all right."

Louis Asbell, private, Troop C, Eighth Cavalry.—First year of service. Weight when trial commenced, 125 pounds; when trial ended, 121 pounds; loss, 4 pounds.

Questioned after the march was concluded:

"I ate the chocolate and the broth from the balance. When I first started I could not eat the rest, but the last two days I got so I could eat the whole ration. The ration was not palatable. My health and strength were good."

John Barker, private, Troop C, Eighth Cavalry.—First year of service. Weight when trial commenced, 142 pounds; when trial ended, 145½ pounds; gain, 3½ pounds.

Questioned after the march was concluded:

"I ate the ration and nothing else during the five days' trial. It was palatable. The first two days I felt rather weak; after that I was all right. The first meal I didn't eat all the ration."

George Doherty, private, Troop C, Eighth Cavalry.—First year of service. Weight when trial commenced, 157 pounds; when trial ended, 160 pounds; gain, 3 pounds.

Questioned after the march was concluded:

"I ate the ration and nothing else during the five days. It was palatable. I noticed no effect on my health and strength. I felt just as usual."

Henry Eskew, private, Troop C, Eighth Cavalry.—First year of service. Weight when trial commenced, 157 pounds; when trial ended, 160 pounds; gain, 3 pounds.

Questioned after the march was concluded:

"I ate the ration and nothing else during the five days. I didn't like it very well, but managed to eat it. I couldn't tell any difference in my health and strength. I felt a little weak at first, but was all right afterwards."

Henson Fellers, private, Troop C, Eighth Cavalry.—First year of service. Weight when trial commenced, 140 pounds; when trial ended, 137 pounds; loss, 3 pounds.

Questioned after the march was concluded:

"I ate the ration and nothing else during the five days. The first few meals it tasted good, but I then got tired of it. It had very little effect on my health and strength. I was about the same at the end as when I started."

Joseph Fromholtz, private, Troop C, Eighth Cavalry.—First year of service. Weight when trial commenced, 139 pounds; when trial ended, 142 pounds; gain, 3 pounds.

Questioned after the march was concluded:

"I ate the ration and nothing else during the five days' trial. It was palatable. My health and strength were the same as usual."

Thomas Crafton, private, Troop C, Eighth Cavalry.—First year of service. Weight when trial commenced, 172 pounds; when trial ended, 172 pounds; no change.

Questioned after the march was concluded:

"I ate the chocolate and part of the rest of the ration and nothing else. At first I didn't like it. Towards the last I ate it better. I couldn't see that it had any effect whatever on my health and strength."

Henry Lee, private, Troop C, Eighth Cavalry.—First year of service. Weight when trial commenced, 128 pounds; when trial ended, 125 pounds; loss, 1 pound.

Questioned after the march was concluded:

"I ate the ration and nothing else during the five days. It was palatable. It had no noticeable effect on my health and strength."

Lucia Jackson, private, Troop C, Eighth Cavalry.—First year of service. Weight when trial commenced, 155 pounds; when trial ended, 153 pounds; loss, 2 pounds.

Questioned after the march was concluded:

"I ate the ration and nothing else during the five days. It was palatable. It had no effect on my health and strength that I know of."

Joe Lourenski, private, Troop C, Eighth Cavalry.—Second year of service. Weight when trial commenced, 175 pounds; when trial ended, 174 pounds; loss, 1 pound.

Questioned after the march was concluded:

"I ate the ration and nothing else during the five days. It was palatable. It made me weak the second night; after that I was all right."

Thomas M. Morris, private, Troop C, Eighth Cavalry.—First year of service. Weight when trial commenced, 161 pounds; when trial ended, 156½ pounds; loss, 4½ pounds.

Questioned after the march was concluded:

"I ate the ration and nothing else during the five days. It didn't taste good the first two days; after that it was all right, and I could eat it with a relish. I didn't feel like working."

Walter J. Merriam, private, Troop C, Eighth Cavalry.—First year of service. Weight when trial commenced, 163 pounds; when trial ended, 163 pounds; no change.

Questioned after the march was concluded:

"I ate the ration and nothing else during the five days. The ration was palatable. I felt weaker, but could do all duty."

Leroy E. Nealey, private, Troop C, Eighth Cavalry.—First year of service. Weight when trial commenced, 146 pounds; when trial ended, 145 pounds; loss, 1 pound.

Questioned after the march was concluded:

"I ate the ration and nothing else during the five days. It was palatable. I couldn't feel that it had any effect on my health and strength."

Louis L. Roskovencky, private, Troop C, Eighth Cavalry.—Second year of service. Weight when trial commenced, 140 pounds; when trial ended, 142 pounds; gain, 2 pounds.

Questioned after the march was concluded:

"I ate the ration and nothing else during the five days. It was palatable. It had no effect whatever on my health and strength."

John J. Ross, private, Troop C, Eighth Cavalry.—First year of service. Weight when trial commenced, 150 pounds; when trial ended, 148 pounds; loss, 2 pounds.

Questioned after the march was concluded:

"I ate the ration and nothing else during the five days. It was palatable, but I didn't like it at first; I liked it at last. My health was all right, but I felt a little weak."

Fred A. Sheldon, private, Troop C, Eighth Cavalry.—First year of service. Weight when trial commenced, 147 pounds; when trial ended, 145½ pounds; loss, 1½ pounds.

Questioned after the march was concluded:

"I ate the ration and nothing else during the five days. The first two meals I couldn't eat much, but after that I could eat all I could get. It had no effect at all on my health and strength that I could notice."

Ralph M. Sherrick, private, Troop C, Eighth Cavalry.—Second year of service. Weight when trial commenced, 155 pounds; when trial ended, 155½ pounds; gain, one-half pound.

Questioned after the march was concluded:

"I ate the ration and nothing else during the five days. It was palatable when cooked. The first few days I felt as well as usual, but the last day I had a sort of diarrhea and felt weak."

Andrew J. Underwood, private, Troop C, Eighth Cavalry.—First year of service. Weight when trial commenced, 150 pounds; when trial ended, 154 pounds; gain, 4 pounds.

Questioned after the march was concluded:

"I ate the ration and nothing else during the five days. It was palatable. I seemed to feel better after eating it than before."

Rog. Randolph, private, Troop C, Eighth Cavalry.—First year of service. Weight when trial commenced, 158 pounds; when trial ended, 160 pounds; gain, 2 pounds.

Questioned after the march was concluded:

"I ate the ration and nothing else during the five days. The first two meals I didn't like it as well as afterwards. I could eat it better at the last. I didn't feel quite as lively and vigorous as before, but I could do all duty."

Eugene Whillock, private, Troop C, Eighth Cavalry.—First year of service. Weight when trial commenced, 152 pounds; when trial ended, 153½ pounds; gain, 1½ pounds.

Questioned after the march was concluded:

"I ate the ration and nothing else during the five days. It was palatable after the first day. It tasted better from day to day. I felt good all the time. I would feel tired and a little weak on getting into camp, but would be all right as soon as I got my dinner. I felt just as well at the end as at the beginning."

Schuyler Williams, private, Troop C, Eighth Cavalry.—First year of service. Weight when trial commenced, 150 pounds; when trial ended, 148 pounds; loss, 2 pounds.

Questioned after the march was concluded:

"I ate any other food than the ration that I could get during the trial."

No further questions were asked this man.

Frederick Thompson, private, Troop C, Eighth Cavalry (teamster).—Fifth year of service. Weight when trial commenced, 174½ pounds; when trial ended, 172½ pounds; loss, 2 pounds.

Questioned after the march was concluded:

"In addition to the ration I ate one ear of corn during the five days. I did not like the ration at first but later I was all right. I sometimes had a headache in the daytime, which I think was due to the want of coffee. Nothing more."

Eduard Morris, civilian teamster.—Weight when trial commenced, 158 pounds; when trial ended, 163 pounds; gain 5 pounds.

Questioned after the march was concluded:

"In addition to the ration I ate one ear of corn during the five days. The ration was palatable. It had no effect on my health and strength except that I had a headache one day. I had an extra pair of pants on the last time I was weighed which accounts for the change in weight."

James J. Thorne, Hospital Corps.—Second year of service. Weight when trial commenced, 157 pounds; when trial ended, 155 pounds; loss, 2 pounds.

Questioned after the march was concluded:

"I ate the ration and nothing else during the five days. It was palatable. It did not have a particle of effect on my health and strength. I was in perfect condition."

Herman Weinman, sergeant, Troop A, Eighth Cavalry.—Twentieth year of service. Weight when trial commenced, 143½ pounds; when trial ended, 143 pounds; loss, one-half pound.

Questioned after the march was concluded:

"I ate the ration and nothing else during the five days. It was palatable. It had no effect at all on my health and strength. I have lived on No. 1 and No. 3 ration. I think No. 1 the better."

Herman S. Dilworth, sergeant, Troop A, Eighth Cavalry.—Third year of service. Weight when trial began, 145 pounds; when trial ended, 143 pounds; loss, 2 pounds.

Questioned after the march was concluded:

"I ate the ration and nothing else during the five days. It was palatable. The first day I couldn't eat much, the next day I felt weak. I then improved every day, and on the last day was in my usual health and strength."

William R. Evans, corporal, Troop A, Eighth Cavalry.—Fourth year of service. Weight when trial commenced, 170 pounds; when trial ended, 168 pounds; loss, 2 pounds.

Questioned after the march was concluded:

"I ate the ration and nothing else during the five days. It was palatable. I could not see any difference in my health and strength."

Charles B. Wheeler, corporal, Troop A, Eighth Cavalry.—First year of service. Weight when trial began, 147 pounds; when trial ended, 147 pounds; no change.

Questioned after the march was concluded:

"I ate the ration and nothing else during the five days. After the first day it was palatable. It tasted better every day I ate it. It had no effect on my health and strength."

Albert B. Russell, cook, Troop A, Eighth Cavalry.—First year of service. Weight when trial began, 173 pounds; when trial ended, 175 pounds; gain, 2 pounds.

Questioned after the march was concluded:

"I ate the ration and nothing else during the five days. It was palatable. I felt better than usual. I have never felt better since I have been in the service. I have lived on No. 1 and No. 3 ration. I think No. 1 better than No. 3."

Charles F. Adams, private, Troop A, Eighth Cavalry.—First year of service. Weight when trial began, 148½ pounds; when trial ended, 145 pounds; loss, 1½ pounds.

Questioned after the march was concluded:

"I ate the ration and nothing else during the five days. It was palatable. It kept my strength up. I lost 1½ pounds, but that was because I left my spurs off when last weighed. I have lived on No. 1 and No. 2 rations. For strength I think No. 1 the better."

Fred. I. Bigford, private, Troop A, Eighth Cavalry.—First year of service. Weight when trial began, 185 pounds; when trial ended, 182 pounds; loss, 3 pounds.

Questioned after the march was concluded:

"I ate the ration and nothing else during the five days, except that I ate a small piece of biscuit on the road as we were coming in the last day. The ration was palatable. It had no effect on my health and strength that I could see. At first I felt hungry and a little weak, but after that was all right."

George B. Bishop, private, Troop A, Eighth Cavalry.—First year of service. Weight when trial began, 185 pounds; when trial ended, 188½ pounds; gain, 1½ pounds.

Questioned after the march was concluded:

"I ate the ration and nothing else until the last night, when I ate a meal of other food. The ration was palatable. I was just about the same as usual. I have lived on No. 1 and No. 3 rations. I consider No. 1 a great deal better than No. 3."

William R. Campbell, private, Troop A, Eighth Cavalry.—First year of service. Weight when trial began, 162 pounds; when trial ended, 162 pounds; no change.

Questioned after the march was concluded:

"I ate the ration and nothing else during the five days. It was palatable. I felt a little weak."

Wiley E. Cheens, private, Troop A, Eighth Cavalry.—First year of service. Weight when trial began, 176 pounds; when trial ended, 173 pounds; loss, 2½ pounds.

Not questioned.

James C. Crum, private, Troop A, Eighth Cavalry.—First year of service. Weight when trial began, 182½ pounds; when trial ended, 186 pounds; gain, 3½ pounds.

Not questioned.

Floyd Evans, private, Troop A, Eighth Cavalry.—First year of service. Weight when trial commenced, 132½ pounds; when trial ended, 130 pounds; loss, 2½ pounds.

Questioned when the march was concluded:

"I ate the ration and nothing else during the five days. It tasted good until the last two days, when I had cramps and couldn't eat it very well. It kept up my strength until the last two days, when I had cramps and felt weak. I have lived on No. 1 and No. 2 rations. For keeping up strength I think No. 1 the best. For taste I would take No. 2."

Jeremiah Foltz, private, Troop A, Eighth Cavalry.—First year of service. Weight when trial began, 154 pounds; when trial ended, 149 pounds; loss, 5 pounds.

Questioned after the march was concluded:

"I ate the ration and nothing else during the five days. It was palatable. It bound me up a little and made me a little weak. I was able to do all duty. I have lived on No. 1 and No. 3 rations. I consider No. 1 more strengthening than No. 3, but No. 3 tasted better."

Benjamin F. Gaines, private, Troop A, Eighth Cavalry.—First year of service. Weight when trial began, 151 pounds; when trial ended, 149 pounds; loss, 2 pounds.

Questioned after the march was concluded:

"I ate the ration and nothing else during the five days. It was palatable. It had no effect whatever on my health and strength."

John L. Hobson, private, Troop A, Eighth Cavalry.—First year of service. Weight when trial began, 139 pounds; when trial ended, 140 pounds; gain, 1 pound.

Questioned after the march was concluded:

"I ate the ration and nothing else during the five days. It was palatable. I was somewhat weaker than usual, but was able to do all duty. I have lived on No. 1 and No. 2 rations. I consider No. 1 better than No. 2."

Henry C. Lewis, private, Troop A, Eighth Cavalry.—First year of service. Weight when trial began, 144 pounds; when trial ended, 145 pounds; gain, 1 pound.

Questioned after the march was concluded:

"I ate the ration and nothing else during the five days. It was palatable. It had no effect whatever on my health and strength. I have lived on No. 1 and No. 2 rations. I consider No. 1 better than No. 2."

Joe E. Lipe, private, Troop A, Eighth Cavalry.—First year of service. Weight when trial began, 163 pounds; when trial ended, 158 pounds; loss, 5 pounds.

Questioned after the march was concluded:

"I ate the ration and nothing else during the five days. I liked it. On the second day I felt weak, but commenced regaining my strength after that."

Clyde E. Moore, private, Troop A, Eighth Cavalry.—First year of service. Weight when trial began, 141½ pounds; when trial ended, 142 pounds; gain, ½ pound.

Questioned after the march was concluded:

"I ate the ration and nothing else during the five days. The first meal was not palatable. I was all right afterwards. It had no effect whatever on my health and strength."

Andrew Myers, private, Troop A, Eighth Cavalry.—First year of service. Weight when trial began, 162 pounds; when trial ended, 164 pounds; gain, 2 pounds.

Questioned after the march was concluded:

"I ate the ration and nothing else during the five days. It was palatable. I felt just as good when I came off as when I went on it."

John L. Osment, private, Troop A, Eighth Cavalry.—First year of service. Weight when trial commenced, 143½ pounds; when trial ended, 143 pounds; loss, ½ pound.

Questioned after the march was concluded:

"I ate the ration and nothing else during the five days. It was palatable. I felt just as good as ever. I have lived on No. 1 and No. 2 rations. I consider No. 1 better than No. 2."

Curtis M. Samuel, private, Troop A, Eighth Cavalry.—First year of service. Weight when trial began, 175 pounds; when trial ended, 175 pounds; no change.

Questioned after the march was concluded:

"I ate the ration and nothing else during the five days. It was palatable. It had a good effect on my health and strength. I felt as well as usual."

Clyde Pierce, private, Troop A, Eighth Cavalry.—First year of service. Weight when trial began, 160 pounds; when trial ended, 159 pounds; loss, 1 pound.

Questioned after the march was concluded:

"I ate the ration and nothing else during the five days. It was palatable. I had good health and good strength. I have lived on No. 1 and No. 3 rations. I consider No. 1 better than No. 3."

John A. Walker, private, Troop A, Eighth Cavalry.—First year of service. Weight when trial began, 157 pounds; when trial ended, 155 pounds; loss, 2 pounds.

Questioned after the march was concluded:

"I ate the ration and nothing else during the five days. It was palatable. It had no effect whatever on my health and strength. I have lived on No. 1 and No. 2 rations. I consider No. 1 the best to keep up one's strength but think No. 2 tastes better, but it made me weak."

William W. Wilken, private, Troop A, Eighth Cavalry.—First year of service. Weight when trial began, 147 pounds; when trial ended, 148 pounds; gain, 1 pound.

Not questioned.

William A. Willey, private, Troop A, Eighth Cavalry.—First year of service. Weight when trial began, 158½ pounds; when trial ended, 159 pounds; gain, ½ pound.

Questioned after the march was concluded:

"I ate the ration and nothing else during the five days. It was palatable. It didn't have any effect at all on my health and strength. I gained, if anything. I have lived on No. 1 and No. 2 rations. I think No. 1 better than No. 2."

Ben. Clark, guide.—Weight when trial began, 188 pounds; when trial ended, 188 pounds; no change.

Questioned after the march was concluded:

"I ate the ration and nothing else during the five days. It was palatable. It had no effect on my health and strength."

The results of these trials may be summarized as follows. Three rations were tested by the board:

The one formulated by the board, which we may call No. 1.

The standard emergency ration, which we may call No. 2.

The one manufactured by Armour & Co., which we may call No. 3.

During five days' trial of each of these rations, 34 men subsisting on No. 1 lost 7½ pounds in weight; 28 men subsisting on No. 2 lost 14½ pounds in weight; 28 men subsisting on No. 3 lost 23 pounds in weight.

In the case of No. 3 the loss shown would probably have been much greater but for the fact that the men became so hungry and weak as to disobey all instructions and procured parched corn and other food whenever it could be obtained. Out of 28 men composing the detachment 18 confessed that they had thus obtained other food than the ration.

During the trials the following questions were asked of each man composing the detachment: Has the ration satisfied your hunger?

Of No. 1, 34 men replied in the affirmative, none in the negative.

Of No. 2, 19 men replied in the affirmative and 9 in the negative.

Of No. 3, 7 men replied in the affirmative and 15 in the negative.

Has it kept up your strength?

Of No. 1, 33 men replied in the affirmative and 1 man, a civilian teamster, stated that "the second day he felt a little weak."

Of No. 2, 8 men replied in the affirmative and 16 in the negative.

Of No. 3, 5 men replied in the affirmative and 22 in the negative.

Do you feel able to perform all duty?

Of No. 1, all replied in the affirmative.

Of No. 2, 21 men replied in the affirmative and 3 in the negative.

Of No. 3, 18 men replied in the affirmative and 5 in the negative.

Have you felt any ill effects in either stomach or bowels after eating the ration?

With No. 1, all replied in the negative.

With No. 2, 17 replied in the negative and 9 in the affirmative.

With No. 3, 16 replied in the negative and 6 in the affirmative.

When each trial was concluded the men were further questioned, as follows:

What effect did the ration have on your health and strength?

Of No. 1, all the men questioned stated it had no effect whatever.

Of No. 2, 5 men stated it had no effect and 21 stated it made them weak.

Of No. 3, 3 men stated it had no effect and 22 stated it made them weak.

Did the ration continue palatable all the time you were using it?

Of No. 1, all replied in the affirmative, and 9 men said it tasted better every day.

Of No. 2, 19 replied in the affirmative and 6 in the negative.

Of No. 3, 20 replied in the affirmative and 6 in the negative.

Did it disagree with you while you were eating it, or did you have any sickness or disagreeable feelings that could fairly be attributed to the ration?

As to No. 1, all replied in the negative.

As to No. 2, 22 men replied in the negative and 3 in the affirmative.

As to No. 3, 16 men replied in the negative and 10 in the affirmative.

What was your physical condition while living on the ration as compared to what it ordinarily is?

With No. 1, all replied it was the same, one man adding that his spirits were somewhat depressed.

With No. 2, 6 men replied it was the same and 19 stated it was not as good.

With No. 3, 3 men replied it was the same and 22 stated it was not as good.

Of 8 men who had lived on No. 1 and No. 2, one stated that No. 2 was more palatable, but he could notice no other difference. The other 7 men said they considered No. 1 the best.

Three men who had lived on No. 1 and No. 3 stated that they considered No. 1 better than No. 3.

No. 3 should not be considered in any case, as it is only to be eaten after further cooking, while one of the main requisites for an emergency ration is that it can be eaten dry as it comes from the can.

This ration is inadequate in any case, and everyone using it became weak and demoralized.

This summary gives the opinions and conclusions of the men who lived on the various rations, and although sometimes poorly expressed and somewhat contradictory, their statements taken together clearly show that Nos. 2 and 3 rations are unsatisfactory, and that No. 1 has fully satisfied the men for whose benefit such a ration is intended.

In the second trial of No. 1, made with a larger command, the loss of weight of 56 men was but 6 pounds. The conditions of this trial were purposely made more severe than in the preceding ones, full cavalry marches being made and actual service conditions observed in every respect. The object of the trial was to ascertain in what condition for service a command would be after subsisting exclusively on this ration during a five days' campaign, and to determine beyond question whether a command could safely undertake such a campaign provided with this ration alone.

At the termination of the trial the men were questioned as follows:

Was the ration palatable?

Fifty replied in the affirmative and 2 in the negative.

What effect did it have on your health and strength?

Forty-two stated it had no effect; 4 stated they felt a little weak; 2 stated they felt weaker than usual; 1 stated he didn't feel quite as lively and vigorous as before; 1 stated he didn't feel like working; 1 stated he had a sort of diarrhea the last day and felt weak; 1 stated it kept his strength up until the last two days, when he had cramps and felt weak. These men all stated they were able to perform all duty.

Three men who had lived on Nos. 1, 2, and 3 stated that they considered No. 1 the best; 6 men who had lived on Nos. 1 and 2 stated that they considered No. 1 the best; 5 men who lived on Nos. 1 and 3 stated that they considered No. 1 the best.

It is not considered necessary in this summary to give the favorable opinions of the various members of the detachment as expressed in their individual statements, and mention is made of the various unfavorable ones only to show how trifling they are when regarded as affecting the efficiency of the command.

In neither of the trials of No. 1 was there the slightest evidence of suffering or weakness in either face or bearing of any of the men composing the detachments, but on the contrary every man looked as fresh and strong at the end as at the beginning of the trial.

In the opinion of the board the ration formulated by it fulfills all the requirements of an emergency ration. The package is of a convenient form for easy carriage on the person and possesses a minimum of bulk, measuring only about 26 cubic inches. The ration is simple in composition and preparation, acceptable as to taste, easy of digestion, possesses good keeping qualities, is capable of quick preparation, requiring no special skill or appliances, and when fire is not available can be eaten without any preparation whatever.

The practical tests have shown that it is capable of keeping up the full muscular strength and endurance of the soldier for a number of days with no suffering from hunger and but a trifling loss in weight.

The board therefore recommends this ration for adoption and issue as the United States Army emergency ration.

S. W. FOUNTAIN,
Captain, Eighth Cavalry.

F. W. FOSTER,
Captain, Fifth Cavalry, Recorder.

APPENDIX V.

SUBSISTENCE FURNISHED THE ALLIED FORCES IN CHINA BY THEIR RESPECTIVE GOVERNMENTS.

OFFICE CHIEF COMMISSARY CHINA RELIEF EXPEDITION.

Pekin, China, March 28, 1901.

COMMISSARY-GENERAL OF SUBSISTENCE, U. S. A.,

Washington, D. C.

SIR: In accordance with instructions I have the honor to submit herewith the following report of observations made regarding the subsistence of troops of the allied forces in Pekin, China. I regret not having been able to submit the report earlier, but I found it difficult to arrange dates with the headquarters of the different armies at times convenient for the chief commissaries of the forces and also for myself. I have noted only the most important facts, such as might prove instructive for us:

BRITISH AND NATIVE TROOPS IN INDIA.

Exhibit A is taken from the "Table of rations for British and native troops in India." The Indian service is distinct and separate from that of the home establishment. To such a degree has this distinction reached that I failed to find a British officer in Pekin who could give me reliable data regarding the subsistence of the home army. I would invite especial attention to the following parts of this extract:

(1) Paragraph 159, under head of "On payment," which relates to issue of rations to officers, newspaper correspondents, etc., upon payment of a stipulated sum.

(2) Paragraph 160, relating to the issue of tobacco.

(3) Particulars of packages in which commissariat stores are usually dispatched to the base and to the field, note that packages seldom weigh over 80 pounds.

(4) Extract "Railway section." The fineness of detail entered upon in this matter must be based upon necessity founded upon past experience.

Exhibit B gives a list of stores kept by British commissariat for sales to officers and enlisted men. This is done only in case the station is separated entirely from the sources of supply. Note the issue of rum and, in certain cases, of opium to the natives.

Exhibit C is the ration-return used in Indian service. To me the most important point of information I obtained from any source was the following: The Indian service maintains at important places in distant countries a comptroller of the treasury, who passes upon the accounts of disbursing officers within his sphere. For troops in China the comptroller is stationed at Hongkong. This permits of prompt correspondence and examination of accounts. The advantages of such a system will undoubtedly be at once apparent. Officers of the commissariat are not required to receipt for stores, but the storekeeper is under bond and is held responsible for stores turned over to him. The officer in charge makes returns of the transactions pertaining to the period of his incumbency, but he can be relieved and sent elsewhere all in a few hours. The storekeeper usually remains a fixture at a station until it is broken up or he dies or is retired on account of old age. The matters to which I have invited attention relate mainly to administration.

Regarding the rations and stores for sale, we are in advance of the British. I have seen nothing in this respect worthy of serious attention.

GERMAN RATION IN PEACE AND IN WAR.

Exhibit D gives the German ration in time of peace and time of war, in garrison, in the field, and on the march. The following are the important points noted:

(1) Each soldier is always required to have in his haversack three days' rations of hard bread, tinned meat, pea soup, salt, coffee, and sugar. The hard bread is put up in a small cotton sack, each sack containing one day's ration. The bread is made into small pieces about 1 inch long, one-half inch thick, and one-half inch wide. It has a sweet taste and is quite palatable. The pea soup is contained in a tin 1½ inches high and 2½ inches in diameter, 3 cakes in each tin, each cake being one day's ration.

The meat is in a tin about the size of a tomato can. The coffee, salt, and sugar are carried in small aluminum boxes about 2½ inches in diameter, about 1 inch deep, with a top that screws on. Three little bags of hard bread, 1 tin pea soup, 1 tin canned meat, 2 boxes with coffee, etc., constitute the three days' ration that every soldier must carry, and which he will use only in case of an emergency, and which he must replenish as soon as emergency is passed.

(2) All soldiers are taught elementary cooking; men mess together in squads of 8, the men cooking in turn. In camp here company messes prevail.

(3) Rations issued daily. Ration return originates in office of the adjutant, being taken from the morning return.

(4) Account of expenditures and stores issued rendered to chief of staff, by whom all are forwarded to Berlin after scrutiny and approval. Each battalion has a paymaster, who goes to store for rations for his battalion each day. (Note.—Our regimental commissaries correspond to this official, but he does not always attend the drawing of rations, which should be made compulsory by regulations.)

(5) In case of arduous operations an issue of spirituous liquor is made.

(6) The Government advances 1,000 marks to battalion commanders with which to establish a canteen. The battalion commander is responsible for the money, which he must return as soon as the profits of the canteen will permit; when this is done, the profits accruing go to the companies, constituting a company fund.

(7) Rations are issued to officers in active campaign. The ration of the United States soldier is of better quality, greater variety, and more abundant than that of the German. No store for sales to officers or enlisted men are kept by them, all purchases being made from battalion canteen described above.

FRENCH RATION IN PEACE AND IN WAR.

Exhibit E gives the ration issued to French soldiers in garrison at Peking, also their ration in quarters and on the march at home. The following important points are noted:

(1) Officers draw rations in campaign as follows: General in chief, 8; general of brigade, 6; field officers, 3; captains, 2; lieutenant, 1½.

(2) Corps of administration maintained. Formed into sections, duties pertain to administration only, both officers and enlisted men being specially trained in the service.

(3) Each soldier required to have always in haversack two days' rations.

(4) A few articles, such as tobacco, soap, etc., kept for sale to officers and enlisted men.

(5) Excellent system seemed to prevail at French commissariat due to presence of a section of the corps of administration, all of whose officers and enlisted men were familiar with the duties pertaining to the care, handling, and issuing of supplies.

(6) Issue of a small portion of lard.

(7) Issue of wine and brandy.

(8) Issues made every four days.

(9) The ration of the United States soldier is of better quality, greater variety, and more abundant than that of the French soldier.

JAPANESE RATION.

Exhibit F gives ration of the Japanese soldier in garrison. The following points were noted:

(1) Each soldier carries in his haversack two days' rations, which are to be used only in case of emergency, and is to be replenished as soon as emergency is passed. This ration consists of 1½ pounds rice, one-half pound tinned meat, and a small quantity of salt.

(2) Four men do the cooking for each company, on the march and in the garrison.

(3) No extra stores kept for sale to officers or enlisted men.

(4) Rations issued to officers.

(5) Each officer in time of war has a soldier detailed to look after his wants, including his cooking and serving of meals.

(6) The ration of the United States soldier is of better quality, greater variety, and more abundant than that of the Japanese soldier.

ITALIAN RATION.

Exhibit G gives the ration of the Italian soldier. As may be seen, this ration compares favorably with ours, both as to quantity and variety; ours, however, has dried fruit and fresh vegetables, which theirs has not; theirs cheese and wine, which ours has not. Following points noted:

The duties pertaining to the supply of the Italian soldiers are performed by a detachment from the corps of administration, the officers and men of which are trained for the duties pertaining thereto. The clerks, storekeepers, butchers and bakers all come from this detachment. The system is excellent. The best field oven I have ever seen is in use by the Italians. It is a recent patent. * * * I am informed that this oven is the invention of an Italian subject who holds a patent on his invention. The advantages are portability and adjustability to the strength of the command, it being divided into sections, one section baking for about 100 men, and by adding sections its capacity may be increased up to baking for about 500 men. While it could be increased beyond this, it would be inadvisable on account of the length and inconvenience in firing.

THE RUSSIAN RATION.

Exhibit H gives the ration of the Russian soldier. The following points were noted: Russians use a soup cart which accompanies a column. The soup can be prepared while marching. I tried to get a photograph of one, but was disappointed. It is a simple affair consisting of a large caldron under which a fire is built, the bed resting upon wheels, and it can be drawn by one or two mules. Their custom is to start the fire in time to permit soup or stew to be ready for issue as soon as camp is made. I consider it an idea well worthy of consideration. Their ration in time of war depends largely upon the resources of the country in which the campaign is carried on. While on the march they have their hard bread, and, if beef is not procurable, chickens or eggs, or whatever is available is satisfactory. If the Russian soldier gets nothing to-day, he will tighten his belt and hope for better luck to-morrow. An allowance not exceeding 22½ cents Mexican per day per man regulates the quantities of food stuffs issued, Exhibit H being conformed to as near as possible. In active campaign each soldier is issued 2 ounces of vodka (a Russian whisky).

EXHIBIT A.

[Extract from "Table of rations for British and native troops."]

RATIONS—BRITISH TROOPS.

151. The field-service scale of rations for British troops is as follows:

	Pounds.	Ounces.		Pounds.	Ounces.
Bread	1	.....	Tea		8
Fresh meat, inclusive of bone.	1	.....	Sugar		2½
Vegetables (fresh)	1	.....	Salt		1
Rice		3	Fuel (see sec. 248)	3	.....

152. The above scale of bread and meat is for occasions when the troops are stationary. When marching, and for the first seven days of any halt, or for longer if the general officer in command thinks it is necessary, the scale will be increased to 1½ pounds of each; the 1½ pounds of meat to be inclusive of bone.

153. When bread can not be baked, or is rejected, and biscuit is not at hand, chuppaties may be issued; 2 pounds ghi, 100 pounds fuel, and 2½ pounds baking powder (see paragraph 240) will be allowed with 100 pounds of meal for chuppaties, which will be cooked by the commissariat bakery establishment attached to the corps. Towahs for cooking chuppaties form part of the bakery equipment (see Appendix 31).

2. Baking powder is a good substitute for yeast when time or exceptional circumstances do not permit of the manufacture of leavened bread, and should only be used under such circumstances or by small bodies of troops not having the services of a baker. In manufacturing bread with baking powder it is necessary to reduce the small lumps which form in packing, and to thoroughly blend the flour and powder before the addition of water, in which salt should be previously dissolved. For every 100 pounds of flour 2 pounds of baking powder and 12 ounces salt are required. Milk is considered better than water, and sour milk better than either. Experience shows that 25 pints fresh milk, or as a substitute 10 tins or 7½ pounds condensed milk to 100 pounds of flour, produce a good palatable bread.

157. The following is the scale of substitutes:

Biscuit: One pound in lieu of bread ration.

Meal (atta): One pound (with ghi, baking powder, and fuel; see paragraph 153) for chuppaties in lieu of bread ration.

Preserved meat: One pound with vinegar, one-eighth ounce in lieu of the fresh-meat ration.

Preserved potatoes: Four ounces in lieu of 1 pound fresh vegetables.

Compressed vegetables: Two ounces in lieu of 1 pound vegetables.

Dal compressed vegetables: Four ounces in lieu of 1 pound vegetables.

Coffee, roasted: One ounce in lieu of five-sevenths ounce tea.

Two Spratt's army meat biscuits, averaging 1 ounce each, in lieu of one-fourth pound bread.

The following is the scale of extras:

Cocoa: One ounce (in addition to the ration of tea).

Rum, 25 U. P.: One dram.

Tea: One-half ounce. } For issue to abstainers when rum is issued to others.

Sugar: One ounce.

Lime juice: One-half ounce. } Antiscorbutic.

Sugar: One fourth ounce.

Extras will only be issued in special cases on the recommendation of the senior medical officer present. They may be authorized by the officer commanding on the spot for any period not exceeding one month at a time, and when so authorized will be issued free. Their issue is restricted to the class mentioned in paragraph 159. In the event of a force for which issues are authorized forming part of larger force, the fact of an issue having been made will be immediately reported by the officer authorizing it, with necessary particulars to the general officer commanding for confirmation, and also to the general officer commanding line of communication, should there be one, for information.

159. The following classes are entitled to rations or substitutes:

FREE.

1. All British troops, including regimental warrant officers.

2. Departmental noncommissioned officers and soldiers (but they may draw ration money in lieu of rations when serving at places where supplies are obtainable).

N. B.—No recoveries will be made from British troops on field service for grocery ration.

3. Other officials, as per Appendix 12.

ON PAYMENT.

- | | |
|---|---|
| 1. Commissioned officers. | } At 1 re per ration (including extras when issued to troops). |
| 2. Newspaper correspondents. | |
| 3. Honorary commissioned officers. | } At 6 annas per ration (including extras when issued to troops). |
| 4. Departmental warrant officers. | |
| 5. Other officials, as per Appendix 12. | |

160. Tobacco, Cayendish, will be issued to British troops, including regimental warrant officers and departmental noncommissioned officers and soldiers, in quantities not exceeding 1 pound per man per month, and on payment at rate fixed in Appendix 56. Corps should indent monthly for their actual requirements at a rate not exceeding 1 pound per man per mensum.

NATIVE TROOPS.

162. The field-service scale of free rations for native troops (including native commissioned officers), is as follows:

Atta, or rice.....	pounds..	1½	Goor ²	ounces..	2
Dal ¹	ounces..	4	Meat (mutton or goat), including		
Ghi.....	do.....	2	bone, weekly.....	ounces..	8
Salt.....	do.....	¾	Onions, or other country vegetable		
Chillies.....	do.....	¾	(to extent locally procurable)		
Turmeric.....	do.....	¾	.....	ounce..	1
Amchur.....	do.....	¾	Fuel (see paragraph 248).....	pounds..	1½

¹The kinds of dal to be provided are as follows: Mung, Chenna, Urrad (Punjab troops). Urrad, Tor (Arhar), Mung (Bengal troops). Tor (Arhar) (Bombay troops; Madras troops).

²Sugar-cane goor (dry) should be supplied, as date goor, which is unsuitable.

164. When meat is issued to meat eaters, either as part of the regular ration or as an extra, goor will not be given to them; but goor will continue to be issued to non-meat eaters on the days on which meat is issued to others; and when meat is issued as an extra, an additional allowance of goor (3 ounces) will be given to nonmeat eaters.

166. Sheep and goats for the meat ration will be made over to native corps, to be slaughtered under regimental arrangements. As far as possible they should be males. (The outturn may as a general guide be taken at half the live weights.)

167. The following is the scale of extras:

Meat: Eight ounces (including bone) when locally procurable.

Goor: Three ounces to nonmeat eaters when meat is issued to others.

Rum, 25 U. P.: One-half dram.

Tea: One-fourth ounce.

Goor for tea: One-half ounce. } To abstainers when rum is issued to others.

Tamarind: To be issued only when locally procurable, and, in addition to ration of amchur, scale to be fixed by the officer commanding on the spot on recommendation of senior medical officer present.

Lime juice: One-half ounce.

Goor or sugar: One-fourth ounce. } Antiscorbutic.

The issue of such extras will be free and is restricted to the classes mentioned in paragraph 168. For procedure in authorizing and reporting all such issues, see paragraph 158.

168. The following classes are entitled to free rations:

1. All native troops, including commissioned native officers and mahouts and assistant mahouts and bullock drivers of heavy field batteries of royal artillery in India.

2. Other officials, as per Appendix 12.

169. Opium will be supplied by the commissariat department on payment at rate fixed in Appendix 56. Corps should indent monthly for their actual requirements, at a rate not exceeding 20 grains per man per diem, which will be the maximum allowance per man.

PUBLIC FOLLOWERS.

172. The field-service scale of rations for public followers is as follows:

Atta or rice.....pounds..	1½	Salt.....ounce..	¾
Dal.....ounces..	4	Amchur.....do....	¾
Ghi.....do....	1	Fuel (see sec. 248).....pounds..	1½

173. Extras will be issued to public followers as shown below: Rum 25 U. P. (Tea with goor to abstainers when rum is issued to others.)

Tamarind; opium.

Lime juice } antiscorbutic.

Goor or sugar }

The issue of such extras will be free. For procedure in authorizing and reporting all such issues see paragraph 158, and for scales see paragraph 167.

PRIVATE FOLLOWERS.

175. Private followers are allowed the same rations as public followers on payment at 3 rupees per month (vide Appendix 56); also extras on payment, providing the stock on hand admits of it. But at places where supplies are plentiful, issues of rations, or extras on payment should not be made if the bazaar can meet the demand. The rates to be charged for extras will be as fixed in Appendix 56.

Particulars of packages in which commissariat stores are usually dispatched to the base and to the field.

Articles.	Description of packages.	Weight.	
		Gross.	Net.
		<i>Pounds.</i>	<i>Pounds.</i>
Amchur.....	Gunny bags.....	82	80
Atta.....	do.....	82	80
Flour.....	do.....	82	80
Coffee.....	do.....	82	80
Chillies.....	do.....	82	80
Dal.....	do.....	82	80
Grain of all sorts.....	do.....	82	80
Goor.....	do.....	82	80
Rice.....	do.....	82	80
Salt.....	do.....	82	80
Sugar.....	do.....	82	80
Turmeric.....	do.....	82	80
Onions.....	Baskets, cylindrical shape.....	82	80
Potatoes.....	do.....	82	80
Biscuits.....	Boxes.....	83	60
Meat biscuits, imported.....	Original cases.....	80	-----
Meat biscuits, local make.....	2 tins in outer wooden cases.....	74	50
Cocoa.....	Boxes.....	80	-----
Hops.....	In 10-pound tins.....	-----	-----
Ghl.....	2 tins of 30 pounds each in a wooden case.....	14	10
Meat, preserved.....	2 and 6 pound tins in original outer cases.....	81	54
Baking powder.....	12 44-pound tins in outer wooden cases.....	76	54
Potatoes, preserved.....	Original case of 8 6-pound tins.....	78	48
Vegetables, compressed.....	Original case of 6 8-pound tins.....	73	48
Tea.....	Lead-lined boxes.....	80	50
Lime juice.....	Camel kegs or mule kegs.....	200	174 ¹
Vinegar.....	do.....	-----	-----
Rum, proof.....	do.....	80	1 6 ¹
Tobacco (Cavendish).....	In original packages.....	25	20
Hay.....	In compressed bales.....	82 to 83	80
Bhoosa.....	do.....	82 to 83	80
All other kinds of fodder.....	do.....	82 to 83	80
Oil, kerosene or vegetable.....	Kerosene oil in original cases to 2 tins, and vegetable oil in similar packages.....	74	64

¹ Gallons.

COMMISSARIAT OFFICER IN CHARGE OF BASE DEPOT GODOWN.

29. He will (in communication with the general of communications or base commandant if necessary) push forward supplies to advanced depots or to the force in the field by every means that may be available, informing the commissary-general in the field daily on F. C. Form 32, of the quantities which have been so forwarded.

RAILWAY SECTION.

445. The railway will convey all commissariat stores to the base depot itself, the wagons for each section being run onto the siding of the section concerned. At each siding one of the railway tally clerks will be present to hand over to the department.

454. The wagons will then be opened, one by one, and their contents placed on the ground opposite them in regular heaps for easy counting. Thus, if a wagon contains 250 bags of grain, the heap would be placed 5 by 5 by 10; this will be done by the railway.

455. The railway and commissariat tally clerks will then enter the contents of each wagon in their tally books and each will sign the other's book in ratification of the transaction, ink or indelible being used. (See paragraphs 458 and 500.) The commissariat book is F. C. Form 27.

456. The train of wagons will then be removed, but it is necessary for the wagons to remain until the books are signed, in case of any dispute, which must be settled at the time and on the spot, it being impossible to settle it afterwards.

457. Discrepancies and damage must be entered in the tally books of both delivery and receiving clerks at the time, and the same brought to notice of the commissariat officer of the railway section, and seen by him before the consignment is removed and before the railway tally clerk leaves. The contents of damaged packages should be examined and counted (or weighed), and if any damage or discrepancy is found the same should be recorded in the tally books of both railway and commissariat

tally clerks, the entry in the latter being initialed by the officer. Commissariat tally clerks will be held responsible if they fail to bring such deficiencies to the notice of the officer.

458. As soon as the tally books have been signed by both tally clerks the responsibility of the railway ceases, and that of the commissariat tally clerk commences. (See paragraph 455.)

459. The commissariat tally clerk having taken over the stores from the railway, will proceed at once to make over the consignment to the storekeeper concerned and will obtain the storekeeper's receipt signature in his tally book, the storekeeper showing in the proper column of the same the date on which each consignment (or portion thereof) is credited in his abstract of receipts. (See paragraph 500.)

460. The credit in the storekeeper's abstract of receipts must be entered by him then and there; i. e., before he makes the entry in and signs the tally clerk's book.

463. The tally clerk's responsibility ceases only when his tally-book counterfoil has been duly initialed by the officer.

EXHIBIT B.

List of stores kept by British commissariat for sales to officers and enlisted men.

Cocoa.	Butter.	Bacon.
Cocoa milk.	Mustard.	Sardines.
Jam.	Pepper.	Cheese.
Pickles.	Tobacco.	Oatmeal.
Sauces.	Ham.	Condensed milk.

EXHIBIT C.

RATION RETURN USED IN INDIAN SERVICE OF BRITISH ARMY.

[F. C. Form 20. Paragraphs 194, 409, 410, 634, 845, 846, 857.]

INDIAN COMMISSARIAT.

[For native corps and transport department.]

Date: _____,
_____ (regiment or battery).

	Strength this day.	Number.	Number of rations drawn.
B.	Fighting men.....		
C.	Public followers.....		
	(Horses.....		
	Grass-cutters' ponies.....		
	Mules, ordnance.....		
D.	Mules, transport, first class.....		
	Mules, transport, second class.....		
	Elephants.....		
	Camels.....		
	Pack bullocks.....		

Number of day's rations drawn—

From _____,

To _____,

(Only one copy of this indent to be submitted. This counterfoil should be carefully kept for future reference.)

N. B.—Certificate marked A to be signed by transport officers when indenting for rations.

REPORT OF THE SECRETARY OF WAR.

[F. C. form 20B. Paragraphs 191, 409, 410, 634, 845, 846, 857.]

NATIVE SOLDIERS—FREE RATIONS.

Date: _____, _____.
 _____ (Regiment or battery).
 Strength this day, No. _____.
 Number of days' rations drawn—
 From _____,
 To _____.
 Number of rations in words: _____.
 Contents received.

Quartermaster or Commanding Officer (Regiment or battery).

This table need not be filled in by the corps or department presenting this indent.

Atta.....
 Or rice.....
 Dhall.....
 Ghi.....
 Salt.....
 Chillies.....
 Turmeric.....
 Amchur.....
 Goor.....
 Onions.....
 Fuel.....

[F. C. form 20C. Paragraphs 191, 409, 410, 634, 845, 846, 857.]

PUBLIC FOLLOWERS—FREE RATIONS.

Date: _____, _____.
 _____ (Regiment or battery).
 Strength this day, No. _____.
 Number of days' rations drawn—
 From _____,
 To _____.
 Number of rations in words: _____.
 (A) Certified that rations are herein drawn only for the number of men actually present and entitled to receive them. (Paragraphs 159 and 177 of Manual.)

Transport Officer.

Contents received.

Quartermaster or Commanding Officer (Regiment or battery).

This table need not be filled in by the corps or department presenting this indent.

Atta.....
 Or rice.....
 Dhall.....
 Ghi.....
 Salt.....
 Amchur.....
 Fuel.....

[F. C. form 20D. Paragraphs 194, 409, 410, 634, 845, 846, 857.]

GOVERNMENT HORSES OR CATTLE—FREE RATIONS.

Date: _____, _____.
 _____ (Regiment or battery).

Strength this day.	Number.	Number of rations in words.
Horses.....		
Grass-cutters' ponies.....		
Mules, ordnance.....		
Mules, transport, first class.....		
Mules, transport, second class.....		
Elephants.....		
Camels.....		
Pack bullocks.....		

Number of days' rations drawn—
 From _____,
 To _____.
 Contents received.

Quartermaster or Commanding Officer (Regiment or battery)

(A) Certified that rations are herein drawn only for the number of animals actually present and entitled to receive them. (Paragraphs 159 and 177 of Manual.)

Transport Officer.

This table need not be filled in by the corps or department submitting this indent.

Number.	Animals.	Grain.	Fodder.	Salt.
	Horses			
	Grass-cutters' ponies			
	Mules, ordnance			
	Mules, transport, first class			
	Mules, transport, second class			
	Elephants			
	Camels			
	Pack bullocks			

EXHIBIT D.

Ration of the German army.

Components.	Time of war.	Time of peace.	
		In garri-son.	On march or in camp.
	Grams.	Grams.	Grams.
Soft bread	750	750	750
Or hard bread	500	500	500
Fresh meat	375	180	250
Or smoked meat, bacon, sausage	200	120	200
Or canned meat	200	100	200
Rice, or pearl barley, or hominy	125	125	125
Or legumens as (pease, beans, lentil) or flour	250	250	250
Or canned vegetables	150	150	150
Or potatoes	1,500	1,500	1,500
Or half of vegetable ration and potatoes together	750	750	750
Salt	25	25	25
Roasted coffee	25	10	15
Or green coffee	30	30	30
Or tea	3	3	3
Sugar	17	17	17

¹ And 40 grams fat.

² And 60 grams fat, or 40 grams lard, or 25 grams butter.

In very strenuous operations a whisky ration of one-tenth liter.

EXHIBIT E.

French ration.

Components.	Time of war—special for China.	Time of peace.	
		In garri-son.	In camp or on march.
	Kilograms.	Kilograms.	Kilograms.
Soft bread	0.750	0.750	0.750
Or hard bread .....	.600	.700	.700
Or pain de guerre (extra hard bread) .....		.600	.600
Fresh meat .....	.500	.400	.500
Or tinned meat .....	.250	.200	.250
Or bacon .....		.240	.300
Rice .....	.040		
And beans .....	.030		
And desiccated vegetables .....	.030		
Or rice .....	.100	.060	.100
Or beans .....	.100		
Or potatoes .....	.750	.450	.750
Salt .....	.020	.020	.020
Sugar .....	.040	.021	.031
Coffee, green .....	.024	.019	.028
Or coffee, roasted .....	.019	.016	.024
Or tea .....	.010		
Lard .....	.030	.030	.030
Soup, condensed .....		.025	.025
Wine	Liters.	Liters.	Liters.
Rum	0.50	0.25	0.25
Brandy .....	.03	.0625	.0625

[Supplement to Exhibit E.]

RATION RETURN OF FRENCH ARMY.

Corps ou service ou groupe.

Nom et grade du signataire du bon: _____.

Officiers: _____

Troupe: _____

	Pain.	Pain de guerre.	Biscuit.	Conserves de viande.	Riz.	Légumes secs.	Julienne.	Sel.	Vin.	Eau-de-vie.	Sucre.	Café.	Saïndoux.	Thé.	Chauffage.	
															Bols.	Charbon.
(1)	(1)															
(2)	(2)															

Date des décisions modifiant le taux des rations.

A _____, le _____, 190-.

¹ Taux des rations.² Inscrire en toutes lettres les quantités à percevoir.

EXHIBIT F.

JAPANESE RATION FOR SOLDIERS IN GARRISON.

	Pounds.
Beef.....	3
Rice.....	2
Vegetables.....	1
Fish, dried.....	1
Sugar.....	1
Salt.....	1
Dried plums.....	1
Wine, Japanese (small quantity).....	1

EXHIBIT G.

Table of the provisions share for the month of April.

Provisions.	Mon-day— Type A.	Tues-day— Type B.	Wednes-day— Type A.	Thurs-day— Type B.	Fri-day— Type A.	Satur-day— Type B.	Sun-day— Type C.	On way— Type D.
Beef meat ¹.....grams..	375		375		375			
Mutton meat.....do..							² 450	
Canned meat.....do..		200		200		200		200
Macaroni.....do..		125	200	125		125		
Rice.....do..	125				125		200	125
Bacon.....do..	25		25		25			
Olive oil.....do..		15		15		15	15	15
Salt.....do..	20	20	20	20	20	20	20	20
Coffee.....do..	15	15	15	15	15	15	15	15
Sugar.....do..	20	20	20	20	20	20	20	20
Beans.....do..	40	40	40	40	40	40		
Cheese.....do..	10	10	20	10	10	10	50	50
Tomatoes conserve, grams.....	5	5	10	5	5	5	5	
Pepper.....grams.....	1	1	1	1	1	1	1	1
Curry.....do..							2	
Wine.....centiliters.....	25	25	25	25	25	25	25	33
Cognac.....do..	4	4	4	4	4	4	4	4
Vinegar.....do..							3	
Tea.....grams.....	3	3	3	3	3	3	3	5
Tunny fish.....do..							50	
Bread.....do..	350	700	350	700	350	700	350	
Biscuit.....do..	300	100	300	100	300	100	300	² 500

¹ For broth and boiled beef.² For stewed mutton, without fat.³ Walking if possible are distributed.

EXHIBIT H.

Ration of the Russian army.

[On a basis of 100 men per day. Russian pound equals 14 ounces avoirdupois.]

Components.	Quantities.
	<i>Pounds.</i>
Fresh beef.....	100
Or corned beef.....	100
Potatoes.....	100
Or sour cabbage.....	50
Onions.....	5
Rice.....	33½
Or pease.....	33½
Fresh bread, black.....	250
Or hard bread.....	125
Tea.....	1½
Sugar.....	3½
Butter.....	5
Salt.....	5

Pepper, spices, and meal to be used in the preparation of soups in quantities as directed by the commanding officer.

Their black bread is issued in loaves weighing about 7 pounds each, the loaf being about the size of the one issued to our soldiers. Besides their tea, they also prepare what they call "kwag," which is made by allowing this black bread to ferment in water, after which it is drawn off and strained.

**REPORT OF THE SURGEON-GENERAL
OF THE ARMY.**

REPORT

OF

THE SURGEON-GENERAL.

WAR DEPARTMENT,
SURGEON-GENERAL'S OFFICE,
Washington, D. C., October 1, 1901.

SIR: In submitting a report of the administration of the duties of this office during the past year I have the honor, first, to invite attention to the financial transactions for the year ended June 30, 1901.

FINANCIAL STATEMENT, 1901.¹

Medical and Hospital Department, 1901.

Appropriated by act approved May 26, 1900	\$2,000,000.00	
Transferred from appropriation "Medical and Hospital Department, 1899," by act approved March 3, 1901..	150,000.00	
	<hr/>	\$2,150,000.00
Sale to Quartermaster's Department	70.00	
Refunded during the year (including transfer settlements by Treasury Department to adjust appropriations, \$45,957.94)	46,234.20	
	<hr/>	46,304.20
Total to be accounted for		<hr/> <hr/> 2,196,304.20
Disbursed during the year:		
Expenses of medical supply depots	563.32	
Medical supplies	1,519,717.50	
Medical attendance and medicines	12,088.26	
Medical expenses of recruiting	37,825.95	
Pay of nurses	83,245.09	
Pay of other employees	141,963.87	
Washing of hospital linen	57,775.28	
Miscellaneous (notary fees, exchange, and expressage)	90.48	
	<hr/>	1,853,269.75
Transferred by Treasury settlement to adjust appropriations		2.67

¹ The disbursements in this statement include settlements with public creditors made by the accounting officers of the Treasury and charged by them to these appropriations.

Balances on hand June 30, 1901:

In United States Treasury and in transit thereto..	\$200,340.00	
In hands of disbursing officers—		
Washington	8,514.06	
St. Louis	19,642.45	
San Francisco	34,472.85	
St. Michael, Alaska	3,521.35	
Havana, Cuba	458.89	
Tientsin, China (Pekin relief expedition)	2,817.25	
Nagasaki, Japan (Pekin relief expedition)	4,631.97	
Manila, P. I.	68,093.10	
Aparri, P. I.	204.74	
Iloilo, P. I.	240.56	
Vigan, P. I.	4.56	
		\$343,031.78
Total accounted for		2,196,304.20

Medical and hospital department, 1900.

Balances on hand July 1, 1900, ¹ acts of March 3, 1899, and February 9, 1900	\$445,463.89
Refunded during the year (including transfer settlements by Treasury Department to adjust appropriations, \$526.62)	2,646.40
Total to be accounted for	448,110.29

Disbursed during the year:²

Expenses of medical supply depots	\$100.94	
Medical supplies	142,908.00	
Medical attendance and medicines	2,898.25	
Medical expenses of recruiting	2,821.65	
Pay of nurses	9,506.76	
Pay of other employees	3,769.19	
Washing of hospital linen	8,232.52	
Miscellaneous (notary fees and exchange)	286.42	
		170,523.73
Transferred by Treasury settlements to adjust appropriations		167,364.28
Balances on hand June 30, 1901:		
In United States Treasury	\$105,403.81	
In hands of disbursing officers—		
Washington	4,117.82	
San Francisco	700.65	
		110,222.28
Total accounted for		448,110.29

Medical and hospital department, 1899.

Balances on hand July 1, 1900, acts of March 15, 1898, January 5, 1899, and March 3, 1899	\$385,081.70
Refunded during the year (including transfer settlements by Treasury Department to adjust appropriations, \$123,015.23)	\$123,079.64
Erroneous deposit on account of board of officer in hospital	24.00
	123,103.64
Total to be accounted for	508,185.34

¹ Including balance at Cebu, P. I., June 1, 1900, the June account from that station not having been received at date of last annual report.

² Including disbursements at Cebu, P. I., during June, 1900, not previously reported. See preceding note.

Disbursed during the year:

Medical supplies	\$1,677.87	
Medical attendance and medicines.....	3,764.83	
Medical expenses of recruiting	114.60	
Pay of nurses	1,544.51	
Pay of other employees	224.13	
Washing of hospital linen	297.30	
Exchange	519.39	
		\$8,142.63
Treasury settlement to cancel erroneous deposit on account of board of officer in hospital		24.00
Transferred to appropriation "Medical and hospital department, 1901," by act approved March 3, 1901.....		150,000.00
Transferred to surplus fund		350,018.71
Total accounted for.....		508,185.34

Medical and hospital department, January 1, 1899.

Balances on hand July 1, 1900, acts of May 4, 1898, June 8, 1898, and July 7, 1898.....	\$26,521.24
Refunded during the year.....	10.29
Total to be accounted for	26,531.53

Disbursed during the year:

Medical supplies	\$952.45	
Medical attendance.....	341.29	
Medical expenses of recruiting	32.40	
Pay of nurses	3.25	
		1,329.39
Transferred to surplus fund		25,202.14
Total accounted for.....		26,531.53

Medical and hospital department, certified claims.

Appropriated by act approved March 3, 1901.....	\$8.50
Disbursed during the year	8.50

Appropriation for national defense, act of March 9, 1898.

Allotment by the President April 16, 1898:

Balance on hand July 1, 1900	\$5.51
Amount not drawn from Treasury, no longer available, dropped to close account on books of this office	5.51

Reallotment by the President September 8, 1898:

Balance on hand July 1, 1900	1,592.59
Amount not drawn from Treasury, no longer available, dropped to close account on books of this office	1,592.59

Allotment by the President October 6, 1898:

Balance on hand July 1, 1900	24,124.63
Refunded during the year.....	99.85

Total to be accounted for	24,224.48
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Disbursed during the year:

Medical attendance.....	\$213.15	
Medical expenses of recruiting	88.40	
		301.55
Amount not drawn from Treasury, no longer available, dropped to close account on books of this office.....		23,922.93
Total accounted for.....		24,224.48

Allotment by the President November 22, 1898:

Balances on hand July 1, 1900	\$21,481.68
Disbursed during the year:	
Medical supplies	\$12.50
Medical attendance	528.00
Medical expenses of recruiting	421.40
Washing of hospital linen	12.50
	974.40
Amount not drawn from Treasury, no longer available, dropped to close account on books of this office	20,507.28
Total accounted for	21,481.68

Reimbursement to contract nurses (traveling expenses).

Appropriated by act approved June 6, 1900	\$4,000.00
Disbursed during the year	677.44
Balance in United States Treasury June 30, 1901	3,322.56
Total accounted for	4,000.00

Artificial limbs, 1901.

Appropriated by act approved June 6, 1900	\$173,000.00
Disbursed during the year	156,814.61
Balance on hand June 30, 1901	16,185.39

Artificial limbs, 1900.

Balance July 1, 1900, act of March 3, 1899	\$43,302.05
Disbursed during the year	6,968.05
Balance on hand June 30, 1901	36,334.00

Artificial limbs, 1899.

Balance July 1, 1900, act of July 1, 1898	\$0.00
Refunded during the year	50.00
Total to be accounted for	50.00
Disbursed during the year	45.32
Balance on hand June 30, 1901	4.68
Total accounted for	50.00

Artificial limbs, certified claims.

Appropriated by act approved March 3, 1901	\$860.21
Disbursed during the year	860.21

Appliances for disabled soldiers, 1901.

Appropriated by act approved June 6, 1900	\$2,000.00
Disbursed during the year	1,454.52
Balance on hand June 30, 1901	545.48

Appliances for disabled soldiers, 1900.

Balance July 1, 1900, act of March 3, 1899	\$979.50
Disbursed during the year	74.25
Balance on hand June 30, 1901	905.25

SURGEON-GENERAL.

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Appliances for disabled soldiers, 1899.

Balance July 1, 1900, act of July 1, 1898	\$690. 11
Transferred to surplus fund	690. 11

Army Medical Museum, 1901.

Appropriated by act approved May 26, 1900.....	\$5,000. 00
Disbursed during the year	2,889. 70
Balance on hand June 30, 1901	2,110. 30

Army Medical Museum, 1900.

Balance July 1, 1900, act of March 3, 1899.....	\$2,113. 43
Disbursed during the year	1,453. 00
Balance on hand June 30, 1901	660. 43

Army Medical Museum, 1899.

Balance July 1, 1900, act of March 15, 1898	\$14. 80
Transferred to surplus fund	14. 80

Library, Surgeon-General's Office, 1901.

Appropriated by act approved May 26, 1900.....	\$10,000. 00
Disbursed during the year	6,675. 87
Balance on hand June 30, 1901	3,324. 13

Library, Surgeon-General's Office, 1900.

Balance July 1, 1900, act of March 3, 1899	\$1,224. 63
Disbursed during the year	1,213. 42
Balance on hand June 30, 1901	11. 21

Furnishing trusses to disabled soldiers (sections 1176, 1177, and 1178, Revised Statutes, and act of March 3, 1879).

Expended during the year	\$7,807. 44
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ARTIFICIAL LIMBS AND THEIR COMMUTATION.

Under the laws relating to artificial limbs there were furnished during the year ended June 30, 1901, 37 artificial legs, 2 arms, and 2 feet, while commutation certificates were issued and paid in the cases of 151 amputated legs, 113 amputated arms, 9 amputated feet, and 2,748 cases in which the loss of the use of a limb was regarded as proved by the evidence on file. These cases involved the expenditure of \$156,814.61 from the appropriations available.

Under existing laws these benefits to disabled soldiers recur every three years, so that the claimants who were furnished with limbs or paid commutation during the past fiscal year are chiefly the survivors of the beneficiaries of the year ended June 30, 1898. The sum of \$173,000 was estimated and appropriated for their benefit, of which, as stated above, \$156,814.61 has been expended. For the current year 1901-1902 the sum of \$125,000 was appropriated, which will probably suffice to meet the requirements of the survivors who were last paid in 1899.

During the year 1902-1903 the cases which were paid in the fiscal year ended June 30, 1900, will again require to be met, together with a series of new claimants resulting from disabilities incurred in the Spanish-American war and the Philippine insurrection. In the year ended June 30, 1900, the sum of \$506,595.24 was expended. It is believed that the number of deaths that have occurred among these beneficiaries will be more than offset by claimants for disability from the war forces of the country in service since 1898, together with the increasing disabilities of the survivors of the Civil war. A careful consideration of the conditions indicates that the estimate for the year ending June 30, 1903, should be at least \$514,000.

Since the commencement of the war with Spain, in April, 1898, 128 men disabled during and since that war have been furnished with or paid for 25 artificial arms, 43 legs, 1 foot, and commutation in 91 cases for the loss of the use of the limb. Twenty-five men lost 1 arm each; 42 1 leg; 1 lost 1 leg and the use of the other; 1 lost 1 foot. Twenty-three men lost the use of 1 arm; 2 the use of 1 arm and 1 leg; 2 the use of 1 arm and both legs; 3 the use of both arms; 13 the use of 1 leg, and 16 the use of both legs.

The following tabulation summarizes the disabilities which have been approved by this office and paid for from the appropriations made annually by Congress since June 17, 1870, to June 30, 1901. On the latter date there remained on the list of beneficiaries 13,200 cases, mostly veterans of the Civil war, with the exception of those mentioned in the preceding paragraph. Most of those marked dropped on the list were taken up again under additional disabilities.

Artificial limbs, apparatus, and commutation June 17, 1870, to June 30, 1901, inclusive.

Disabilities.	1870-1875.						1875-1890.					
	Allowed.	Died.	Dropped.	Rejected.	Casualties.	Remaining.	Allowed.	Died.	Dropped.	Rejected.	Casualties.	Remaining.
Loss of—												
1 arm	4,724	1,966	172	1	2,139	2,585	152	55	8	....	63	89
1 arm and 1 leg	20	11	1	....	12	8	....	....	....	....	....	....
1 arm and use 1 arm	9	4	....	....	4	5	7	5	....	....	5	2
1 arm and use 1 arm and 2 legs .....	....	....	....	....	....	....	....	....	....	....	....	....
1 arm and use 1 leg	2	2	....	....	2	....	1	1	....	....	1	....
2 arms	32	16	1	....	17	15	....	....	....	....	....	....
2 arms and 2 legs	1	1	....	....	1	....	....	....	....	....	....	....
1 leg	4,659	1,734	157	3	1,894	2,765	148	60	10	....	70	78
1 leg and 1 foot	8	1	1	....	2	6	1	1	....	....	1	....
1 leg and 1 foot and use 2 arms	1	1	....	....	1	....	....	....	....	....	....	....
1 leg and use 1 arm	7	4	....	....	4	3	5	1	....	....	1	4
1 leg and use 2 arms	2	2	....	....	2	....	....	....	....	....	....	....
1 leg and use 1 leg	8	4	1	....	5	3	8	4	....	....	4	4
2 legs	45	18	3	....	21	24	....	....	....	....	....	....
1 foot	76	25	5	2	32	44	....	1	....	....	....	7
2 feet	15	9	2	....	11	4	2	....	1	....	1	1
Loss of use of—												
1 arm	1,740	734	87	31	852	888	794	311	47	40	398	396
1 arm and 1 leg	11	8	1	1	10	1	20	10	4	1	15	5
1 arm and 2 legs	2	2	....	....	....	....	5	3	1	1	5	....
2 arms	8	5	....	....	....	....	20	11	1	....	12	8
2 arms and 2 legs	1	....	....	....	....	....	14	14	....	....	14	....
1 leg	587	284	65	24	373	214	504	209	47	19	276	229
2 legs	31	13	2	3	18	13	57	35	12	....	47	10
Total	11,989	4,844	498	66	5,408	6,581	1,747	722	131	61	914	833

Artificial limbs, apparatus, and commutation, etc.—Continued.

Disabilities.	1880-1885.						1885-1890.					
	Allowed.	Died.	Dropped.	Rejected.	Casualties.	Remaining.	Allowed.	Died.	Dropped.	Rejected.	Casualties.	Remaining.
Loss of—												
1 arm	103	42	3		45	58	53	16			16	37
1 arm and 1 leg	1					1						8
1 arm and use 1 arm	3	1	1		2	1						1
1 arm and use 1 leg									1			1
1 arm and use 2 legs							2	1			1	1
1 leg	122	33	5	1	39	83	146	45	2	2	49	97
1 leg and 1 foot							1	1			1	1
1 leg and use 1 arm							4	3			3	1
1 leg and use 1 arm and 1 leg	1					1						3
1 leg and use 1 leg	1					1	7	4			4	3
2 legs	4	3			3	1	2	1			1	1
1 foot	10	2	2		4	6	6	2			2	4
1 foot and use 1 leg							1	1			1	1
2 feet	5	1			1	4	1					1
Loss of use of—												
1 arm	1,937	521	64	157	742	1,195	1,374	309	25	75	409	965
1 arm and 1 leg	68	21	6	8	35	33	142	47	8	13	68	74
1 arm and 2 legs	21	11	3	2	16	5	24	10	1	2	13	11
2 arms	31	14	5	4	23	8	61	27	8	3	38	23
2 arms and 1 leg	6	3	1		4	2	10	9	1		10	
2 arms and 2 legs	57	42	3	1	46	11	60	33	3	3	39	21
1 leg	1,393	447	104	149	700	693	1,302	350	63	91	504	798
2 legs	203	98	20	16	134	69	252	119	15	18	152	100
Total	3,966	1,239	217	338	1,794	2,172	3,457	978	127	207	1,312	2,145
Disabilities.	1890-1893.						1893-1896.					
	Allowed.	Died.	Dropped.	Rejected.	Casualties.	Remaining.	Allowed.	Died.	Dropped.	Rejected.	Casualties.	Remaining.
Loss of—												
1 arm	29	5			5	24	8					8
1 arm and use 1 arm	1					1	1					1
1 arm and use 1 arm and 2 legs	1					1						1
1 arm and use 1 leg	1					1	1					1
1 arm and use 2 legs							1					1
1 leg	72	15			15	57	61	5			5	56
1 leg and use 1 arm	1					1						
1 leg and use 1 arm and 1 leg	1	1			1							
2 legs	1					1	2	1			1	1
1 foot	5	2			2	3						
Loss of use of—												
1 arm	298	61	6	11	78	220	75	13	1	1	15	60
1 arm and 1 leg	85	25	2	2	29	56	22	8	1		9	13
1 arm and 2 legs	9	4			4	5	4					4
2 arms	19	7	2		9	10	6	1	1		2	4
2 arms and 1 leg	5	2		1	3	2	1					1
2 arms and 2 legs	32	14	1	2	17	15	18	9			9	9
1 leg	329	72	11	16	99	230	107	9	3	4	16	91
2 legs	99	37	6	7	50	49	49	15		4	19	30
Total	988	245	28	39	312	676	356	61	6	9	76	280

Artificial limbs, apparatus, and commutation, etc.—Continued.

Disabilities.	1896-1899.					1899-1902.				Recapitulation.					
	Allowed.	Died.	Dropped.	Casualties.	Remaining.	Allowed.	Died.	Casualties.	Remaining.	Allowed.	Died.	Dropped.	Rejected.	Casualties.	Remaining.
Loss of—															
1 arm.....	13				13	20			20	5,102	2,084	183	1	2,268	2,834
1 arm and 1 leg.....										21	11	1		12	9
1 arm and use 1 arm.....										29	10	1		11	18
1 arm and use 1 arm and 2 legs.....										2	1			1	1
1 arm and use 1 leg.....										3	3	1		4	2
1 arm and use 2 legs.....										3	1			1	2
2 arms.....										32	16	1		17	15
2 arms and 2 legs.....										1	1				
1 leg.....	6	1		1	5	40			40	5,254	1,893	174	6	2,073	3,181
1 leg and 1 foot.....										10	3	1		4	6
1 leg and 1 foot and use 2 arms.....										1	1			1	9
1 leg and use 1 arm.....										17	8			8	
1 leg and use 1 arm and 1 leg.....										2	1			1	1
1 leg and use 2 arms.....										2	2			2	
1 leg and use 2 arms and 1 leg.....	1				1					1					1
1 leg and use 1 leg.....										24	12	1		13	11
2 legs.....	1				1	1			1	56	23	3		26	30
1 foot.....	2	1		1	1					107	33	7	2	42	65
1 foot and use 1 leg.....										1	1			1	
2 feet.....										23	10	3		13	10
Loss of use of—															
1 arm.....	93	4		4	89	41			41	6,352	1,953	230	315	2,498	3,854
1 arm and 1 leg.....	20				20	6			6	374	119	22	25	166	208
1 arm and 2 legs.....	4				4	5	1	1	4	74	31	5	5	41	33
2 arms.....	5		1	1	4	3			3	153	65	18	8	91	62
2 arms and 1 leg.....	2				2	1			1	25	14	2	1	17	8
2 arms and 2 legs.....	10	1		1	9	10			10	202	113	7	6	126	76
1 leg.....	111	6	3	9	102	75			75	4,408	1,377	296	303	1,976	2,432
2 legs.....	40	7		7	33	28			28	759	324	55	48	427	332
Total.....	308	20	4	24	284	230	1	1	229	23,041	8,110	1,011	720	9,841	13,200

APPLIANCES FOR DISABLED SOLDIERS.

During the past year the sum of \$1,528.77 was expended for 192 appliances issued to disabled soldiers.

TRUSSES.

The number of trusses issued and fitted during the year was 1,054, at a cost of \$7,807.44.

PROVIDENCE HOSPITAL.

The act of Congress approved June 6, 1900, appropriated \$19,000 for the support and medical treatment of destitute patients in the city of Washington, D. C., under a contract to be made with this hospital by the Surgeon-General of the Army. The relief afforded under this appropriation was as follows:

Patients in hospital July 1, 1900.....	135
Admitted during the year.....	1,576
Total number treated.....	1,711
Average number admitted per month.....	142
Number remaining in hospital June 30, 1901.....	102
Total number of days' treatment afforded.....	46,794
Average number of days' treatment per patient.....	41
Average number of patients treated per day.....	128
Longest term of treatment (days).....	365
Shortest term of treatment (day).....	1
Number of patients in hospital during the whole year.....	23

ARMY AND NAVY GENERAL HOSPITAL, HOT SPRINGS, ARK.

Officers' division.—Three officers remained under treatment December 31, 1899—2 on the active army list and 1 on the navy retired list. Twenty-four were admitted during the calendar year 1900—Regular Army 9, Volunteer Army 2, army retired list 5, navy active list 5, and navy retired list 3. Twenty-seven officers were therefore treated during the year, against the same number in the year 1899. Twenty-one were returned to duty, or returned to residence much benefited by their treatment in the hospital; an average of 69.52 days, ranging from 4 days to 155 days. The maximum number treated at one time was 10, in December, 1900; the minimum 2, in September, 1900. Of the 6 remaining under treatment December 31, 1900, 4 belonged to the Regular Army, 1 to the Volunteer Army, and 1 to the navy retired list.

Enlisted men's division.—In this division there remained under treatment December 31, 1899, 58 men—42 belonging to the Regular Army and 16 ex-volunteers. Three hundred and eleven cases were entered for treatment, making the whole number treated during the year 369. Two hundred and nine of these cases consisted of rheumatism in its various forms, 61 diseases of the digestive system, 25 diseases of the nervous system, 27 malarial fevers and cachexia, and 47 other disabilities.

Eighty-one of the men were discharged on certificates of disability, 30 on expiration of term of service or by order of the War Department, 50 remained under treatment December 31, 1900—enlisted men 41, ex-volunteers 9—and 208 were returned to duty or, if ex-volunteers, returned to their homes very much improved.

THE UNITED STATES GENERAL HOSPITAL FOR THE TREATMENT OF PULMONARY TUBERCULOSIS AT FORT BAYARD, N. MEX.

In October, 1899, Fort Bayard, N. Mex., was, on my recommendation, discontinued as a military post, and its buildings were transferred to the Medical Department of the Army for conversion into a sanatorium or hospital for the treatment of cases of pulmonary consumption. As the abandonment of the post had been in contemplation for some years, the buildings were in poor condition and required many repairs and improvements to fit them for hospital use. These were speedily effected, and the hospital is now in excellent condition. The selection of Fort Bayard as a site for a sanatorium has been amply justified by the results. Its location in the dry mountainous region of southern New Mexico, at an altitude of 6,040 feet, affords a climate permitting comfortable outdoor life during the entire year. The mean maximum and minimum temperatures and the precipitation for the past decade were as follows:

Month.	Mean maximum.	Mean minimum.
January.....	52.77	23.15
February.....	54.18	25.83
March.....	60.52	30.92
April.....	68.43	37.10
May.....	77.33	45.45
June.....	86.45	52.68
July.....	82.91	55.34
August.....	85.32	56.98
September.....	81.97	52.09
October.....	71.84	41.20
November.....	61.29	31.90
December.....	53.20	24.66
General average.....	69.56	39.79

During the year 1900 only 52 cloudy days were noted.

Precipitation.

	Inches.		Inches.
1891.....	19.30	1896.....	18.85
1892.....	8.89	1897.....	18.00
1893.....	15.47	1898.....	15.91
1894.....	9.12	1899.....	10.43
1895.....	15.09	1900.....	12.66

The following is from the report of Maj. D. M. Appel, surgeon, United States Army, in command of this Hospital:

Instructions to patients.—Consumption is an infectious disease caused by a germ which is found in the spit, therefore the spit, together with everything coughed up by patients, must be carefully destroyed. Should it be allowed to dry and in the form of dust float around in the air, millions of these germs would be set free, and would endanger not only those who are well, but would often reinfect the sick, and thus undo the benefit derived from months of care.

Spit only in your spit cup or into the large spittoons provided for that purpose; never on the floor, in the bath tubs, sinks, or closets, nor in your handkerchiefs.

Carry your own spit cup with you everywhere, spit into it carefully, to avoid having to wipe your lips, whiskers, or the edges or sides of your cup. Never swallow your spit.

The only safe method of disposing of the spit is by burning it, therefore the paper cups and spittoons must be burned when half filled and the frames washed frequently with carbolic solution. Should you by accident spit on the floor or bedclothes or spill your cup, report it at once to insure proper disinfection.

To be benefited by this most excellent climate you must live outdoors as much as possible, and always when indoors keep the windows open.

Go to bed early; take moderate exercise when not instructed to the contrary; eat your meals slowly and chew your food thoroughly.

Do not help yourself to food from any dish except your own plate with your own fork or spoon, but use those provided for that purpose. Try to refrain from coughing at meals. You can with slight effort do much to prevent it.

The use of stimulants and cigarettes is forbidden. Smoking and chewing tobacco in moderation is permitted. Whiskers and mustaches must be closely trimmed.

Patients not bedridden must observe the following rules:

1. They must occupy their quarters only from 7.30 p. m. until 8 a. m.
2. They must make their own beds and neatly arrange their personal belongings, none of which are to be left on the floors.
3. They must stay outdoors at least 8 hours daily.
4. They must not visit in quarters.
5. They must bathe at least once a week.

* * * * *

Each patient is provided with a spit cup of the pattern made by Seabury & Johnson, consisting of a tin frame with spring cover, in which is placed an impervious paper receptacle, and large covered spittoons with paper receptacles are scattered throughout the rooms and on the porches frequented by the patients. A shelf is fitted under each chair in the dining rooms, on which the spit cup is placed during meals. The spit cups, and also the dejecta from patients with intestinal tuberculosis, are destroyed in crematories, four of which are now in use.

Abundant good and nutritious food is provided, and the dairy furnishes an ample supply of milk. Patients are weighed every Friday. The weights are recorded, and the report of the gains and losses affords a good index of progress.

The old post hospital is occupied as an infirmary for bedridden cases, including not only those in which the disease is far advanced, but all febrile patients whose maximum daily temperature reaches 101° F. In a large majority of these cases, after a short period of absolute rest, the fever permanently subsides.

The treatment pursued consists mainly of outdoor life, ample good food, and rest. Regulated exercise is permitted when advisable. The ambulant cases are daily instructed in breathing exercises. Cod-liver oil with guaiacol is extensively administered, and in some cases guaiacol carbonate is prescribed in 1-gram doses twice daily. The laryngeal lesions, as a rule, do well with a simple spray of 1 per cent tricresol in liquid vaseline, which apparently prevents pyogenic infection, and the tuberculous lesion improves with the general condition. Otherwise the treatment is symptomatic. Tuberculin is used only for diagnostic purposes.

From October 3, 1899, to December 31, 1900, 283 patients were admitted, as follows:

Officers (including 1 retired).....	6
Enlisted men, Regular Army (of whom 114 remained, after discharge from service, as beneficiaries of the Soldiers' Home, and 1 after retirement)	196
Discharged soldiers, as beneficiaries of the Soldiers' Home	49
Enlisted men, volunteers	23
Discharged volunteers, by special authority	2
Acting assistant surgeons, assigned to duty at hospital	2
Civilian clerk, assigned to duty at hospital	1
Civilian clerk, temporary admission authorized by Surgeon-General	1
Civilian residing at post.....	1
Female nurses	2
Total	283

Of the 283 patients admitted, 124 were discharged, 34 died, and 125 remained under treatment.

To elucidate the results better, the cases are divided into three classes, viz: (1) Cases exhibiting permanent afebrility, without tubercle bacilli in the sputum; (2) cases exhibiting permanent or approximately permanent afebrility, with tubercle bacilli (pure tuberculosis or a minor degree of mixed infection); (3) cases exhibiting permanent febrility, with tubercle bacilli (mixed infection).

Certain features common to all these cases are worthy of emphasis. The first and most striking is the apparent permanency of the different types. Cases in which the maximum daily temperature does not drop below 100° F. shortly after admission usually remain permanently febrile. These are true cases of phthisis pulmonalis, and the results in this class are no better than in less favorable climates. Cases afebrile on admission, or those where, following absolute rest, the temperature drops below the febrile point shortly after admission, also exhibit great permanency of type, and the same is true of the remaining class, viz, febrile cases without tubercle bacilli. In these last two types favorable results may be anticipated, especially in the latter.

The next feature which merits attention is the relatively insignificant rôle of a tuberculous family history as an etiologic factor in pulmonary tuberculosis, when contrasted with the importance of the lessened resistance resulting from a preexisting disease. A prominent feature, and one which militates against the best results at this hospital, is the limited period that patients remain under treatment, the average being but four and one-tenth months, and in such a markedly chronic disease this must be considered in the interpretation of the statistics. Many were discharged at their own request, convalescent and improved, who, after their discharge from the service, were unwilling to submit longer to the necessarily rigid rules and regulations of the hospital. Many also were unable to resist the pangs of nostalgia, due largely to the isolated location of the hospital and the aridity of the vicinity.

In 51 per cent of the cases there had been a history of pulmonary hemorrhages. When this is contrasted with the fact that they have occurred in but 15 cases at this hospital, it is evident that the prevalent opinion that residence in a high altitude is contraindicated in such cases has no foundation in fact. In 78 per cent of the cases the disease was contracted in the Tropics.

Reinfections, diarrheas, night sweats, and intercurrent diseases, owing to the hygienic environment, play an unimportant part in the course of the disease as manifested in this hospital. In 90 per cent of the cases there was evidence of the pulmonary affection in the conformation of the chest.

In five cases the diagnosis of pulmonary tuberculosis was not confirmed, as follows: In three the physical signs gave evidence of "healed tuberculosis," and the tuberculin test was negative on admission. One patient had septic bronchitis and died of acute peritonitis of unknown origin, and the fifth had tuberculosis of the chest walls and pleura, without involvement of the lungs. In this case the tuberculin test was also negative on admission, and death resulted from rupture of an aortic aneurism. Of the remaining 153 patients who were discharged or died, 16 were under treatment less than one month, and are not, therefore, considered in this report of results, leaving 137 patients, of whom 24, or 17 per cent, died; 42, or 30 per cent, were unimproved; 33, or 23 per cent, were improved; 22, or 16 per cent, were convalescent; and 16, or 11 per cent, were clinically cured.

Patients are classed as convalescent when no tubercle bacilli are found after repeated examination, and, though active symptoms have almost disappeared, they still react to the tuberculin test. Those who, after all symptoms have disappeared, fail to react to the tuberculin test are recorded as clinically cured.

Of the 137 patients who died or were discharged, 30, or 22 per cent, exhibited perma-

nent afebrility, and when admitted had no tubercle bacilli in their sputum (class 1). In these the following facts were elicited on admission: Family history was negative in 23 and positive in 7. In 9 the pulmonary tuberculosis was complicated by other diseases of the lungs or pleura, viz, emphysema, fibrosis, chronic bronchitis, and pleuritis with effusion. In 1 there was tuberculosis of the peritoneum in addition to the pulmonary lesion. Secondary anemia was present in 14; hyperleukocytosis in 3. In none did the blood show degeneration of red cells or myelocytes. In all the presence of adventitious organisms in the sputum was a marked feature. These organisms, named in order of frequency of their occurrence, though several varieties are commonly found in one specimen, are: Staphylococci, streptococci, Micrococcus pneumoniae crouposae, Friedlander's bacillus, Micrococcus tetragenus, Leptothrix buccalis, and sarcinae. In 20 cases, or 66 per cent, the tuberculosis was secondary to a preexisting disease: Malaria ranked first, being a factor in 10; pneumonia next, in 7; dysentery in 2, and pleurisy in 1. In 22 patients, or 73 per cent, the pulmonary disease was evidenced by the conformation of the chest, viz, retraction of tissues over apices, drooping of one shoulder, narrowing of intercostal spaces, and rigidity of ribs; only 4 of this class presented tuberculous facies when admitted. In 22 the lesion was infiltration, and in the remainder infiltration plus consolidation. The diazo-reaction was absent in all. In 16 there was a history of pulmonary hemorrhage. In 22 the tuberculin test confirmed the diagnosis; in 2 cases, at first negative, tubercle bacilli subsequently appeared.

In contrast to the above data, which illustrate the condition on admission, the following facts were noted at the time of discharge: Twelve, or 40 per cent, of these 30 patients were clinically cured; 13, or 43 per cent, convalescent; and 5, or 16 per cent, unimproved. In 10 there were complicating pulmonary affections; this is 1 more than on admission, 1 patient developing emphysema while under observation. Anemia was present in 4, which is 10 less than on admission. Hyperleukocytosis was present in 2. In 1 patient tubercle bacilli did not appear in the sputum until 5 months after admission. Adventitious organisms were present in the sputa in 12, which includes all who had any expectoration on discharge. None had tuberculous facies at the time of discharge, but 18 presented evidence of disease in conformation of chest, which is 4 less than on admission; 12 presented the physical signs of a lesion, best described by the term "healed tuberculosis;" 17 still presented the physical signs of infiltration, and 1, which is 6 less than on admission, had infiltration plus consolidation. Only 1 of this class had a hemorrhage while under observation, notwithstanding that over 50 per cent presented a history of hemorrhage. In 9 of the 12 discharged as clinically cured, the tuberculin test was negative. The other 3 objected to the tuberculin test, but were entirely without symptoms of active disease, and it was therefore considered unnecessary to insist upon its administration. Four of this class had a relapse, in 3 tubercle bacilli were present for a short time, and they were found in but 1 at the time of discharge. The diazo reaction was still absent in all.

*Conclusions in regard to afebrile patients without tubercle bacilli (class 1).—*This class presents a pure type of tuberculosis without mixed infection. Slight secondary anemia is often present, but is never marked or constant. Degenerated red corpuscles are never present, abnormal leukocytes are very rare, and when found are apparently accidental and ephemeral, and the same is true of hyperleukocytosis. Adventitious organisms in the sputum are a permanent feature while expectoration continues, and they therefore bear no relation to the presence or absence of mixed infection, as there is no mixed infection in this class.

The typical lesion is a slight infiltration of one apex, with or without signs of activity, though some consolidation is occasionally encountered. Increased density, occasionally associated with moisture over the affected area, even after the patient has passed the tuberculin test and are clinically cured, is uniformly present. A history of previous hemorrhage occurs in this class as often as in others, but a hemorrhagic tendency is not exhibited. The prognosis in this class is very good, as evidenced by 12 clinical cures and 13 discharged convalescent before complete arrest of the disease could be reasonably expected. In this class the diazo-reaction is never observed. The average daily maximum temperature is 98.9° F., which is evidence that pure uncomplicated tuberculosis is an afebrile affection.

In the 2 cases where the tuberculin test was negative on admission, tubercle bacilli subsequently appeared, possibly as the result of reinfection in a susceptible subject. In one case this is the most probable explanation, for the tubercle bacilli did not appear until five months after the test; this patient was the only one of this class discharged with tubercle bacilli in the sputum. In the other it is hardly so applicable, for the tubercle bacilli were found within a week after passing the test and apparently as a result of the action of the tuberculin; however, within a few weeks the

bacilli disappeared, the patient again passed the test, and was finally discharged clinically cured. In this case also the tuberculin test failed to demonstrate the existence of tuberculosis. In one patient in whom there was complicating fibrosis and arteriosclerosis the tuberculin reaction had an unfavorable influence upon the subsequent course of the disease, though in this case tubercle bacilli were never found, and the patient was discharged unimproved. In still another case a negative result of the tuberculin test was followed by an evening temperature slightly above 99° F. for several weeks, though it subsequently fell to normal.

Of the second class, afebrile cases with tubercle bacilli, 59 patients were discharged. In these the general course of the disease was afebrile, and when fever occasionally occurred it was always amenable to rest treatment.

The following facts were elicited from them on admission: In 45 the family history was negative, in 1 unknown, and positive in the remaining 13. In 4 there were complicating affections of the lungs. In 3 there was chronic laryngitis. In 10 there were other complications, including malaria, cerebral syphilis, chronic nephritis, hernia, anal fistula, dementia, otitis media, and hemiplegia. There was tuberculosis of other organs in 8, as follows: Testicles 2, peritoneum 1, larynx 2, inguinal glands 1, and intestinal tuberculosis 2. In 42 there was secondary anemia. In 35 there was hyperleucocytosis. In 9 there was degeneration of red cells, and myelocytes were present in 5. Adventitious organisms were present in the sputum of 12. The pulmonary tuberculosis was preceded by some other disease in 40, or 68 per cent. As in the previous class, malaria led, being the inciting cause in 23, malaria and dysentery together in 4, chronic diarrhea in 3, influenza in 2, catarrhal jaundice in 1, perineal abscess in 1, tuberculosis of cervical glands in 1, and pneumonia in 5. Tuberculous facies was present in 15. In 52 there was evidence of the pulmonary disease in the conformation of the chest. In 30 there was a history of hemorrhage. The diazo-reaction was present in 3. The lesion in 24 was infiltration alone; in 25 there was infiltration plus consolidation, and in the 9 remaining there was infiltration, consolidation, and cavities.

Their condition on discharge was as follows: None of these patients died; 18, or 29 per cent, were unimproved; 28, or 48 per cent, were improved; 9, or 16 per cent, were convalescent, and 4, or 6 per cent, were clinically cured. None of this class ever became permanently febrile. In 20 there was secondary anemia, or 15 less than on admission. Hyperleucocytosis was present in 22, or 15 less than on admission. Neither degeneration of red cells nor myelocytes were present in any. Tubercle bacilli were absent from the sputum in 10. In 4 there was no expectoration. Adventitious organisms were present in 13, and were mostly confined to those patients in whom tubercle bacilli had disappeared. Tuberculous facies was present in 13. Evidence of disease in conformation of chest persisted in 45, or 7 less than on admission. At the time of discharge the lesion in 4 was "healed infiltration," infiltration alone in 30, consolidation plus infiltration in 17, and cavities still persisted in 8. There was therefore a marked improvement in the character of the lesion in this class, particularly in the resolution of consolidated areas. The least change occurred in the cavity cases, and they of course present the most unfavorable type. In 6, hemorrhages occurred while under observation. The tuberculin test was negative in 2 at the time of discharge; the other 2 discharged clinically cured objected to the tuberculin test, and it was not considered necessary to insist upon its administration. The diazo-reaction persisted in but 1 case, although this patient improved. There was no relapse in this class. The average maximum daily temperature was 99.5° F.

Conclusions in regard to afebrile patients with tubercle bacilli.—This class presents either a pure type of pulmonary tuberculosis or minor degrees of mixed infection. The latter is readily and accurately estimated by the degree of hyperleucocytosis, which, as has been seen, was present in the majority of these cases on admission. That mixed infection in a minor degree, as in this class, is amenable to treatment is illustrated by the smaller number presenting hyperleucocytosis at the time of discharge and by the following results: Four clinically cured, 9 convalescent, and 28 improved, out of a total of 59. This is preeminently the type of the disease in which time is required to effect cure or arrest, and in which it is so difficult to impress the fact upon the patients, owing to the absence of pain or other distressing symptoms. The influence of other tuberculous lesions was apparently slight, even in the few cases where such complications occurred. Of 7 that presented tuberculosis of other organs only 3 were discharged unimproved; in one case with laryngeal ulceration, and in another with genitourinary involvement, the improvement was remarkable.

Secondary anemia, a marked feature of these cases, disappeared in 50 per cent of those who exhibited it on admission. Adventitious organisms in the sputum were confined mostly to the most favorable cases, and became a constant feature when the tubercle bacilli disappeared.

The tendency of this type is toward recovery, as evidenced by the fact that none died, and but 17 out of 59 were discharged unimproved. The diazo-reaction occurs rarely, and only in the least favorable cases.

Of the third class, cases exhibiting permanent febrility with tubercle bacilli, 48 were discharged or died. In them the facts elicited on admission were as follows: The family history was negative in 35 and positive in the remaining 13. In 6 there were complicating diseases other than tuberculosis. In 12 there was tuberculous involvement of other organs, of the larynx in 9. Secondary anæmia was present in all; hyperleucocytosis in all; degeneration of red cells in 15; myelocytes in 6, and adventitious organisms in the sputum of 14. In 28 the tuberculosis followed some other disease. Again malaria led, being a solitary factor in 10 cases, malaria with dysentery or chronic diarrhea in 3, dysentery in 4, pleuritis in 3, pneumonia in 2, typhoid fever in 2, chronic diarrhea in 2, measles in 1, and appendicitis in 1. All of these cases presented tuberculous facies, and all gave evidence of the disease in the conformation of the chest. There was a history of pulmonary hemorrhage in 20. The diazo-reaction was present in 23.

Of the 48 in this class, 24, or 50 per cent, died; 20, or 42 per cent, were discharged unimproved, and 4, or 8 per cent, improved in general condition. None was cured or discharged convalescent, and 13 had tuberculosis of other organs, 1 more than on admission. This patient developed intestinal tuberculosis while under observation. None ever became afebrile. All those discharged presented anemia and hyperleucocytosis, 19 had degeneration of red cells, and in 6 there were myelocytes. In 1 tubercle bacilli were absent from the sputum, but were found in pus withdrawn from the pleural cavity. Adventitious organisms were still present in 10. In 4, all of whom died, hemorrhages occurred while the patients were under observation. The diazo-reaction was present before death or discharge in 30. Consolidation, infiltration, and cavity or cavities were present in 38 cases; 9 had consolidation and infiltration, and but 1 infiltration alone. The average maximum daily temperature in this class was 101.5° F., which is much lower than is commonly observed among similar cases in lower altitudes.

Conclusions.—The family history does not assume a more important place in this than in other types of the disease. Tuberculosis of other organs is more frequently present, particularly laryngeal tuberculosis, and though the latter is not directly a cause of death it contributes to the fatal termination. Hyperleucocytosis and more or less severe anæmia are constant features. As might be foreseen, degeneration of red cells as a manifestation of advanced secondary anemia is present more frequently than in any other class, but its absence can not be interpreted as indicating a favorable prognosis. This is likewise true of the presence of myelocytes in the blood and the diazo-reaction in the urine. Another fact readily anticipated from the nature of the cases in this class is the constant evidence of disease in the conformation of the chest and the tuberculous facies.

Adventitious organisms in the sputum, if they bear any relation to mixed infection, would certainly be a feature of this class, which is undoubtedly one of mixed infection, and yet they were absent in the large majority of cases, and when present were apparently accidental and without relation to the type. With a death record of 50 per cent and a hopeless prognosis in the remainder, the futility of climatic treatment for this class is unquestionable.

Of the 125 patients remaining under treatment December 31, 1900, in 2 the diagnosis was not confirmed, as the tuberculin test was negative on admission, and they were apparently cases of "healed tuberculosis." Twenty-three had been under treatment less than one month, leaving 100 cases for consideration, with results as follows: Twenty-six unimproved, 48 improved, and 26 convalescent.

Of the first class, afebrile cases without tubercle bacilli, there were 23 patients. In these the following facts were elicited on admission: In 20 the family history was negative and positive in 3. Complicating pulmonary affections existed in 7, and other complicating diseases in 4. There was tuberculosis of other organs (inguinal glands) in but 1; 13 presented varying degrees of secondary anæmia; there was hyperleucocytosis in 3. Degeneration of red cells or myelocytes were not observed in this class. Adventitious organisms were present in the sputa of 19, the other 4 having no expectoration. In 18, or 78 per cent, the tuberculosis was preceded by another disease, malaria in 7, dysentery in 5, pleuritis in 2, pneumonia in 1, yellow fever in 1, chronic diarrhea in 1, and inflammatory rheumatism in 1. Tuberculous facies was absent in all. In 17 there was evidence of the disease in the conformation of the chest. The lesion was infiltration alone in 21; in 2 infiltration plus consolidation. In 7 there was a history of pulmonary hemorrhage. The tuberculin test was positive in 22; the one case in which it was negative on admission gave a characteristic reaction later. The diazo-reaction was absent in all.

Conditions December 31, 1900: Four, or 17 per cent, were unimproved; 19, or 83 per cent, were convalescent; complicating pulmonary affections persisted in 6. The tuberculous inguinal glands had been removed by operation. Anæmia persisted in 6, 7 less than on admission; hyperleucocytosis in 2, 1 less than on admission. Tubercle bacilli appeared in 6 and were still present in 3 of these. In 6 expectoration had ceased. In 13 adventitious organisms persisted. The lesion remained unchanged in all but 2, in which consolidation heralded the appearance of tubercle bacilli in the sputum. In no case had a hemorrhage occurred since the patients were under observation.

Of the second class, afebrile patients with tubercle bacilli, there were 63 under treatment. The following facts were elicited on admission: The family history was negative in 49 and positive in 14. In 4 there were complicating pulmonary diseases; in 21 there were other complications. In 5 there were tuberculous lesions of other organs—the intestines, tonsils, lower jaw, testicle, and larynx. Secondary anæmia was present in 40, hyperleucocytosis in 39, degeneration of red cells in 3, and myelocytes in 1. Adventitious organisms were present in 19. In 41, or 83 per cent, the tuberculosis followed some other disease—malaria in 24, dysentery in 5, chronic diarrhea in 3, pneumonia in 2, pleuritis in 2, chronic bronchitis in 1, influenza in 2, typhoid fever in 1, and syphilis in 1; 24 patients presented tuberculous facies. In 60 there was evidence of the disease in the conformation of the chest. The lesion in 31 was infiltration, in 27 there was infiltration plus consolidation, and in the remaining 5 cavities were present. Thirty-six presented a history of hemorrhage. The diazo-reaction was present in 5.

Their condition December 31, 1900, was as follows: Thirteen, or 20 per cent, unimproved; 44, or 69 per cent, improved, and 6, or 9 per cent, convalescent. Complicating diseases of the lungs persisted in 4. In 13, 8 less than on admission, other complications remained. In 4, 1 less than on admission, there were still other tuberculous complications, the lesion of the lower jaw having completely healed. Twenty-five, 15 less than on admission, were anæmic, and 31, 8 less, had hyperleucocytosis. Two had degeneration of red cells and myelocytes. In 6 the tubercle bacilli had disappeared from the sputum. In 19 there were adventitious organisms in the sputum. Nineteen, 6 less than on admission, had tuberculous facies. Nearly all gave evidence of the disease in the conformation of the chest. In 28 there was infiltration alone, in 26 infiltration plus consolidation, and in the remaining 9 cavities, practically the same as on admission. Four had pulmonary hemorrhage while under observation. Six presented the diazo-reaction, 1 more than on admission. One patient relapsed after having become convalescent.

Of the third class, presenting permanent febrility and tubercle bacilli, 14 remained under treatment December 31, 1900. The following facts were elicited on admission: The family history was negative in 12 and positive in 2. Five presented complications other than tuberculosis. There was tuberculosis of the larynx in 2, and in 1 there was tuberculous pyopneumothorax. Anæmia and hyperleucocytosis were present in all, degeneration of red cells in 2, myelocytes in 1, and adventitious organisms in but 5. In 9, or 64 per cent, there was a history of preceding disease—malaria in 7, pneumonia in 1, and pleuritis in 1. Tuberculous facies was present in all but 1, and evidence of the disease in the conformation of the chest in all. In 6 the lesion was consolidation and cavity; in the remainder consolidation plus infiltration. In 8 there was a history of pulmonary hemorrhage. The diazo-reaction was present in 6.

Their condition December 31, 1900, was as follows: Nine, or 64 per cent, were unimproved; 4, or 28 per cent, improved in general condition, and 1 convalescent. Three presented other complications, 2 less than on admission, in which malaria and dysentery had disappeared. Three still presented complicating tuberculosis, 1 became afebrile, 10 continued anæmic—4 less than on admission; 11, or 3 less, had hyperleucocytosis, 1 had degeneration of the red cells, and 1 presented myelocytes. Tubercle bacilli had disappeared from the sputum in 1, adventitious organisms were present in all but 2, 12 had tuberculous facies, and the entire number had evidence of the disease in the conformation of the chest. In each one the lesion was the same as on admission. Two had pulmonary hemorrhage while under observation, and 7 had the diazo-reaction.

In general, it may be said that the prognosis of these patients is a trifle better than for those of the same type discharged, owing to a process of selection, only the most favorable remaining; but even in these there is little prospect of ultimate cure.

The case of the patient who became convalescent and in whom the tubercle bacilli disappeared is worthy of note. Here there was pyopneumothorax of the left chest. For months the patient was bedridden, expectorating from one-half to 1 liter of offensive pus daily. At one time his weight was reduced to 89 pounds, the evening temperature was constantly from 101 to 103° F., but his appetite, though capricious,

remained. Expectoration suddenly ceased almost entirely, the patient improved and now weighs 136 pounds, and except for a badly injured left lung is practically well.

The combined results of 236 patients, who had been under treatment for one month or over, are as follows: Twenty-four, or 10 per cent, died; 68, or 28 per cent, are unimproved; 80, or 33 per cent, are improved; 48, or 20 per cent, are convalescent, and 16, or 6 per cent, are clinically cured.

The report from this hospital for the fiscal year ended June 30, 1901, is as follows:

Remaining July 1, 1900.

Regular Army:	
Officers	3
Enlisted men (of whom 26 remained as beneficiaries of the Soldiers' Home after discharge from service)	37
Female nurses	1
	<hr/> 41
Beneficiaries of the Soldiers' Home	38
Total	79

Admitted during the year.

Regular Army:	
Officers (including 1 retired)	3
Contract surgeons	1
Enlisted men (of whom 107 remained as beneficiaries of the Soldiers' Home after discharge from service)	188
Female nurses	1
Retired enlisted men	1
Civilians	5
	<hr/> 199
Volunteers:	
Officers (Porto Rico Battalion)	1
Enlisted men (of whom 4 remained temporarily after discharge from service)	37
	<hr/> 38
Beneficiaries of the Soldiers' Home (133 enlisted men remained as beneficiaries of the Soldiers' Home after discharge from the service, and 1 remained after being retired)	28
Total	344

During the year 184 patients were discharged, as follows:

Regular Army:	
Officers	1
Enlisted men discharged from service	17
Enlisted men returned to duty	5
Enlisted men retired	2
Female nurses	2
Civilians	4
	<hr/> 31
Volunteers:	
Enlisted men discharged from the service (of whom 4 remained temporarily after discharge)	33
Beneficiaries of the Soldiers' Home	120
Total	184

Died during the year.

Enlisted men of Regular Army.....	15
Enlisted men of Volunteers.....	4
Beneficiaries of the Soldiers' Home.....	21
	<hr/> 40

Remaining June 30, 1901.

Regular Army:	
Officers (including 1 of Porto Rico regiment)	6
Contract surgeons	1
Enlisted men	54
Civilians.....	1
	<hr/> 62
Beneficiaries of the Soldiers' Home.....	58
	<hr/> 120
Total	344

Of those who died, 10 were under treatment less than one month, as follows:

Enlisted men of the Regular Army.....	6
Enlisted men of Volunteers.....	3
Beneficiaries of the Soldiers' Home	1

Total

10

Of the 184 patients discharged, 17 were under treatment less than one month. The remaining 167 were under treatment an average of 5.4 months, and their condition on discharge was as follows:

Clinically cured	10
Convalescent.....	26
Improved.....	73
Not improved.....	58

Total

167

During the year an antiphthisic serum, by a St. Louis, Mo., firm, was tried in 33 cases, the patients willingly submitting to the treatment. Contract Surgeon E. S. Bullock conducted the experiments, and reported his results, as follows:

With two exceptions (in which the serum was used on the urgent request of the patients) the cases treated were selected from the more favorable cases, and all were febrile. In 10 cases the treatment was discontinued within a few days, the patients being discharged or objecting to its continuance.

The serum was administered daily in initial doses of 0.005 and increased at the rate of 0.005 per week to 0.015, which dose was continued during the remainder of the treatment.

In a majority of the cases a disagreeable reaction resulted in five or six days, consisting of a rise of temperature, malaise, headache, and cutaneous irritation (either urticarial or erythematous). In four cases there was an extremely distressing, though ephemeral, instantaneous reaction, in which there was an intense fullness in the head, flushing of the face, pain in the lumbar region, and marked dyspnea, in all probability due to the introduction of the serum directly into the circulation.

In six cases the treatment was discontinued after an average of 18 days on account of a permanent rise of temperature, which subsided shortly after its discontinuance.

In five cases there was no apparent change in the condition of the patient during the treatment, which was continued 45 days in two; 63, 89, and 170 days, respectively, in the others—an average of 82 days.

In six cases the condition of the patient was aggravated during the treatment. In these it was continued 36, 46, 62, 71, 77, and 134 days, respectively—an average of 71 days.

In six cases the patients improved both before and during the treatment, which was continued 170 days in three; 31, 51, and 70 days, respectively, in the others—an average of 110 days. The favorable results in these six cases were no better than in many similar cases under treatment in this hospital without the use of serum.

The following report from the attending surgeon United States Soldiers' Home, Washington, D. C., shows the provision made for the care and comfort of the inmates of that institution when sick:

REPORT ON THE BARNES HOSPITAL, UNITED STATES SOLDIERS' HOME, WASHINGTON, D. C., JANUARY 30, 1901, BY MAJ. L. A. LA GARDE, SURGEON, UNITED STATES ARMY.

A description of the hospital devoted to the care of the sick among the inmates of the Soldiers' Home, the institution which forms a retreat for disabled discharged soldiers of our Regular Army, would seem appropriate at a time when the Army, as recently enlarged, is furnishing it with more patients than ever before.

The care of the discharged army invalid, the erstwhile recruit, seasoned soldier, and finally, the faithful old warrior who willingly sacrificed the best years of his life to his country's military service, is ever a matter of public interest, and it becomes especially so to the Army and its medical department. The average number of inmates in the Home for each of the years 1897, 1898, 1899, 1900, was, respectively, as follows: 722, 751, 807, 838. The figures show a marked increase in the last two years as a result of a larger army and casualties incident to recent campaigns in war.

Number of inmates in the United States Soldiers' Home June 30, 1901, with their length of active service.

Service.	Number.	Service.	Number.
5 months.....	1	14 years.....	10
6 months.....	4	15 years.....	21
7 months.....	2	16 years.....	20
8 months.....	3	17 years.....	14
9 months.....	4	18 years.....	26
10 months.....	2	19 years.....	29
1 year.....	23	20 years.....	101
2 years.....	47	21 years.....	71
3 years.....	64	22 years.....	47
4 years.....	14	23 years.....	38
5 years.....	38	24 years.....	30
6 years.....	16	25 years.....	25
7 years.....	12	26 years.....	23
8 years.....	21	27 years.....	9
9 years.....	20	28 years.....	6
10 years.....	15	29 years.....	2
11 years.....	20	31 years.....	2
12 years.....	22		
13 years.....	24	Total.....	826

Age of inmates.

Years.	Number.	Years.	Number.
21 years.....	1	55 years.....	41
22 years.....	2	56 years.....	32
23 years.....	1	57 years.....	40
24 years.....	2	58 years.....	28
25 years.....	5	59 years.....	31
26 years.....	3	60 years.....	17
27 years.....	5	61 years.....	33
28 years.....	5	62 years.....	18
29 years.....	10	63 years.....	30
30 years.....	12	64 years.....	20
31 years.....	5	65 years.....	29
32 years.....	5	66 years.....	22
33 years.....	6	67 years.....	14
34 years.....	6	68 years.....	17
35 years.....	13	69 years.....	13
36 years.....	8	70 years.....	10
37 years.....	4	71 years.....	18
38 years.....	2	72 years.....	9
39 years.....	5	73 years.....	11
40 years.....	7	74 years.....	6
41 years.....	2	75 years.....	10
42 years.....	7	76 years.....	8
43 years.....	8	77 years.....	5
44 years.....	3	78 years.....	10
45 years.....	12	79 years.....	2
46 years.....	19	80 years.....	3
47 years.....	9	81 years.....	4
48 years.....	19	83 years.....	1
49 years.....	14	85 years.....	1
50 years.....	13	88 years.....	1
51 years.....	11	94 years.....	1
52 years.....	33		
53 years.....	40	Total.....	826
54 years.....	44		



BARNES HOSPITAL, FRONT VIEW.

Nativity of inmates.

Born in—	Number.	Born in—	Number.
United States	339	Denmark	8
Ireland	218	Norway	5
Germany	156	France	10
England	36	Russia	3
Scotland	9	Belgium	3
Austria	8	Roumania	1
Canada	12	East India	1
Sweden	9		
Switzerland	8	Total	826

The Barnes Hospital, devoted to the care of the sick of the Home, may be thus described:

The hospital, first occupied in 1876, is built of brick and consists of a central administration building, measuring 52 by 55 feet, two pavilion wings, each 64 by 29 feet, having two end towers, and an annex. The central building has a basement, three stories, and a mansard roof, while the rest of the structure, including the annex, has two stories, with basement and mansard. Many changes have been made in the hospital since it was first occupied. These changes have reference to heating and ventilation, lighting, new furniture, elevator service, introduction of cold storage in place of ice, the use of steam in lieu of coal and gas, alteration in kitchen, etc. The annex, which constitutes the principal addition, was occupied in April, 1899, thereby increasing the capacity of the hospital from 82 to 112 beds.

Heating and ventilation.—The hospital is now heated by hot water, with direct indirect radiation, instead of the inverted-siphon system, with provision for heating inlet air from chambers heated by hot-water pipes. The latter, including the boilers pertaining to the heating system, needed renewal after long usage, so that the simpler method referred to was adopted. The exit air from the wards is carried by ducts in the ceiling to a central shaft, which receives heat from the smokestacks of the heating apparatus.

Lighting.—Lighting by gas was supplanted by electric lighting in 1898. The power is owned by the Home. New white-enameled combination pendants were put in place of the old gas chandeliers in 1899.

New furniture.—The old-style iron bunks and wooden tables for the wards have been replaced by modern white-enameled beds and glass-top tables. Rolling chairs have been added to the wards and for use in the grounds; the men's boxes, formerly painted a yellow color, were painted with white enamel.

Elevator service.—In a hospital having so many cripples and long-lived invalids the effort to ascend and descend stairways is always irksome. This was especially true of the Barnes Hospital, in which the sole opportunity to relieve the daily routine of ward life lay in an airing on the porch. The construction of the annex afforded a central location—at the junction of the two buildings—for an elevator, which is run by hydraulic pressure. Many invalids who seldom left the building are now free to go about the grounds, and to go to their meals three times a day, when formerly their food had to be carried to them—a practice which, aside from many other objections, was very laborious to the ward nurses.

Cold storage.—The value of cold storage in institutions used as habitations in recent years has been so thoroughly demonstrated on sanitary and economic grounds that the opportunity to embrace this modern convenience was very wisely decided upon in the construction of the annex. The machine in use is the Remington, which enables us to make 200 pounds of ice per day, and supplies in addition cold storage to two boxes for food stuffs in the commissary and culinary departments and one box for the reception of cadavers in hot weather.

Steam.—Upon the construction of the annex in 1899 the proximity of the pump house to the hospital rendered the introduction of steam feasible for a number of uses. (1) Formerly the bath water for all the bathrooms was heated by three distinct fires in the basement. This practice entailed a good deal of labor aside from being a source of much nuisance. Water for bathing purposes in all the rooms and for use in kitchen and dining room is now heated by a steam coil in a large boiler centrally located in the basement. (2) The introduction of steam, as stated, enables us to operate the cold storage at a fractional cost, and it furnishes heat for the bain-marie and plate warmer in the kitchen and the sterilizers in the operating room.

Alteration of kitchen.—With other recent changes the partition in the kitchen which divided it from the pantry was torn down, converting the two rooms into one large room. The old wooden floor was taken up and a new terrazo floor put in its place

to correspond to that in the dining room. The cooking range, which was small before, was increased by another oven, and this addition to the cooking area necessitated a larger hood to carry off the heat and vapors. The kitchen has been further provided with a bain-marie, plate warmer, and an overhead rack on which to hang cooking utensils, tea and coffee urns, etc.

The annex.—The annex is composed of three stories and basement. The basement is divided through its length and width by halls, and it is further divided into rooms for supplies, heating apparatus, cold storage, and machinery for elevator. The first floor is divided in its length by a well-lighted hall, 5 feet by 54 feet, which connects with 8 commodious rooms, 5 of which are used as surgical wards, each containing 2 beds, while the other 3 are devoted to the use of the nurses and the storage of linen. At the northern exposure of the building are located the water-closet and bath, the etherizing, operating, and sterilizing rooms, also the laboratory for clinical microscopy and X-ray apparatus. The second floor contains a medical ward, 30 by 54 by 14 feet, with 14 beds; 2 isolation wards, one 16 by 20 feet and the other 16 by 18 feet, 3 beds to each; ward master and nurses' rooms, a special diet kitchen, linen room, and bath and water-closet. Before the construction of the annex the dining room was located on the second floor of the administration building, under the kitchen. The room was small, seating but one-third of the men at a time, so that it was necessary to set the table three times for each meal. The construction of the annex gave the opportunity to put the dining room on the same level with the kitchen. All of the space which corresponds to the ward below was devoted to this purpose. There is now a spacious dining hall, 54 by 29 feet, with a seating capacity of 104, which can be increased to 130, when needed, without crowding. The rest of the space at the end of the building is devoted to bathroom and water-closet for use of the dining room and kitchen help, a pantry, a china closet, sleeping rooms for the dining-room men, etc.

The advances in the field of diagnosis in recent years have rendered thoroughly equipped laboratories for research into the causes of disease an indispensable feature of all general hospitals. With this idea in view it was determined to place the Barnes Hospital on a footing with the leading hospitals of this country. Under the active supervision of Dr. A. B. Herrick, the clinical assistant, we now have a well-appointed laboratory for clinical microscopy, supplemented by a Röntgen-ray apparatus and photographic department.

The pathological and anatomical material is worked up and recorded. Analyses are made of the urine, sputum, gastric juice, and stools, which are most valuable for diagnostic purposes; also bacteriological cultures are taken when necessary, as a further aid to diagnosis. The Edison break-wheel X-ray machine formerly in use is about to be replaced by a static machine more suited to a fixed hospital. Bullets have been located, fractures reduced and placed in apposition under the direct light of the X-ray; also, later, they are examined, by means of the ray, directly through dressings.

Operating room.—The operating room occupies the space at the north end of the annex. It is a spacious, well-lighted room, with two anterooms in which to etherize patients and to conduct the sterilizing of instruments, dressings, etc. The furniture and fixings were supplied by the Kny-Scheerer Company, of New York, and the appointments generally are of the best.

The medical ward has 14 beds and two isolation rooms of 3 beds each, with a ward master and 4 nurses. The surgical ward, of 10 beds, has a ward master and 3 nurses. The two upper convalescent wards (C and F) have each 16 beds and two small rooms of 1 bed each. A ward master is in charge of each ward. E ward, comprising seven small rooms, has a nurse in charge. B ward, of 12 beds, on the second floor, is used for old, chronic cases, most of whom are unable to go to their meals, and is in charge of a ward master and 2 nurses. A and D wards, on first floor, of 13 beds each, with ward master and 1 nurse to each, are for chronic cases and men on wheeled chairs who can go to their meals by the elevator.

The kitchen, on the third floor, has a chief and second cook, and 3 men as dish-washers, preparing vegetables, etc. It is supplied with a modern range of sufficient capacity for over 150 men, and all modern conveniences. The dining room is also on the third floor, connected with the kitchen by a corridor, and food is brought direct to the tables on a large wheeled car, which later is used to take the dishes, etc., to the pantry to be washed. It is in charge of a chief and 5 assistants.

The duties of the steward are to superintend the entire hospital, under the orders of the surgeon in charge. He has charge of all the property and all the employees, and keeps the hospital in order; is responsible for the care of instruments, medical supplies, books, and everything in the hospital. He also keeps the records, with such clerical assistance as may be necessary. He has under him a druggist to dispense the medicines and a commissary-sergeant to attend to the rations and laundry

work, a chief cook, chief of dining room, chief of nurses, firemen, laborers, etc. He consults daily with the surgeon in charge with regard to all matters of hospital administration, and receives his instructions.

The following list is given to show the cause of mortality among men who have engaged in the military service. Like all mortuary statistics, in former times these have been imperfectly kept, and therefore no reliable deductions can be made from them. The list is here given for what it is worth. Reference to the present method of observing the causes of death will be made later.

From January, 1876 to June 30, 1901 (25½ years), there were 914 deaths, as follows:

Disease.	Number.	Disease.	Number.
Abscess:		Fever:	
Brain	2	Malarial	2
Pancreas	1	Typhoid	1
Psoas	2	Frozen to death	3
Alcoholism	10	Gangrene:	
Aneurism, aorta	34	Pulmonary	5
Apnea	1	Senile	5
Apoplexy	29	Gastritis	15
Arthritis, chronic	1	General debility	3
Asthenia	1	Hepatitis	8
Asthma	1	Hematemesis	3
Bright's disease	38	Hemiplegia	2
Bronchitis	10	Hemophilia	1
Cancer:		Hernia, femoral, strangulated	1
Axilla	1	Hip joint, disease of	2
Bowels	4	Lateral scleroses	1
Bladder	1	Leukemia	1
Epithelial	9	Lockjaw	1
Gall bladder	1	Locomotor ataxia	4
Larynx	1	Meningitis	9
Liver	6	Nerve disease, exhaustion from	2
Mesentery	5	Obstruction of bowels	2
Parotid	1	Old age	55
Prostate	1	Paralysis:	
Rectum	1	General	17
Stomach	18	Of heart	7
Cerebral hemorrhage	12	Paraplegia	4
Cholera morbus	1	Pericarditis	4
Cirrhosis of liver	15	Peritonitis	8
Congestion of brain	24	Pleurisy	4
Consumption	220	Pneumonia	82
Cystitis, chronic	5	Pyemia	1
Diabetes mellitus	8	Rheumatism, chronic	3
Diarrhea, chronic	12	Rupture of heart	2
Disease of heart, mitral	10	Scalds	2
Disease of heart, valvular	74	Septicemia	1
Drowned	11	Stricture of rectum	1
Edema of glottis	1	Suicide	25
Embolism	9	Sunstroke	2
Empyema	1	Syphilis, tertiary	8
Enteritis	6	Tumor of brain	7
Epilepsy	2	Wounds:	
Erysipelas	2	Gunshot	1
Fatty degeneration of heart	4	Incised	1
Fractures:			
Hip	2		
Neck	1		
Skull	3		

Clinical report.—The cases treated at this hospital may be divided into two main groups: (a) Those affecting the old men, and being essentially the diseases due to degeneration of the various systems; (b) those affecting the young men, and being almost entirely either the remote effects of gunshot wounds or invalidism, etc., following tropical service. In the first group we find chronic affections of the lungs, rheumatism, the sclerosis of the heart, arteries, and kidney, and various degenerations of the nervous system, especially tabes dorsalis. The second group is composed of, first, the various remote effects of gunshot wounds; second, neuritis, myelitis, debility, etc., following the various fevers; third, chronic dysentery. The main diseases affecting both groups are malarial fever, influenza, pleurisy, and pneumonia.

The cases of influenza occurring during the past year were of a very mild character, there being no fatal results from the disease. It was usually of a febrile and painful form, the mucous surfaces appearing only to suffer slightly. One case is worthy of mention from its close resemblance to typhoid fever, from which it differed by absence of Widal reaction and the typhoid rash.

Affections of the lungs are of very common occurrence, one of the most frequent

complaints being a "stitch in the side." The attacks of pleurisy are of a very light character. The disease is usually a dry inflammation, running a short course of severe pain and fever, and clearing up in a few days. In a few cases it is of a more severe character and runs a prolonged course, with fever, night sweats, etc. The tubercle bacilli are found, often only after numerous careful examinations. Pneumonia generally occurs here among the aged, and rarely appears in the typical form. Usually the consolidation is not so complete and firm that the breath sounds have that characteristic tubular quality, but have rather a bronchial modification, with dullness and increased fremitus. The fever is usually low, often dropping to sub-normal. Chronic bronchitis forms a large part of the lung cases. It is of a very obstinate form, usually obscure in its origin and very resistant to any treatment. One form is often associated with slight attacks of pleurisy. In this association inflammatory processes due to the tubercle bacillus are always carefully sought after, often with positive results. This, together with the very acute, almost pneumonic type, forms the usual methods of onset of tuberculosis seen at this hospital. The diagnosis of the latter disease is never positively affirmed without finding the bacilli in the sputum. In doubtful cases the tuberculin reaction is tried. In this connection the appearance of the lung when viewed by the X-ray is of interest. The difference between the normal lung and one but slightly infiltrated by the tubercular process is easily determined and best appreciated by direct view of the thorax with the fluoroscope. Cavities in the lung are very definitely revealed. The tuberculous cases are sent to the general hospital at Fort Bayard, N. Mex., as soon as the diagnosis is assured. But, besides these, there are every year a few cases which are admitted in the last stages, or in which the disease assumes such a malignant form that they have to be treated here, necessitating an isolated room devoted to the care of such cases only.

Arterial degenerations are seen mainly among the aged, but often cases occur where there appears to be a premature breakdown of the blood vascular system. All forms are seen, and the process not only involves the arteries themselves, but extends into their finer ramifications, thus appearing in the organs of the body, especially the kidneys. The arteries of the brain are frequently involved, as seen by the numerous hemiplegias continually present. Heart disease is very common, but is usually a mild sclerosis of the valves, without symptoms other than those of general arterial breakdown. True valvular disease is rarer than the above form, and is also far more amenable to treatment.

Rheumatism occurs in all its forms, and rheumatoid affections are frequent. The most common form seen is the muscular, next the articular, and then the syphilitic. The gonorrheal type is rare, only two cases appearing on the records of the past year. In the acute articular form we have aspirated the kneejoint in two cases for micro-organisms with a negative result. Gout is relatively infrequent. Arthritis deformans is more common; a few cases are always present, showing the disease in all stages, from mild involvement to complete ankylosis. One case is of interest because of the extreme form manifested. The patient, a young man, after a sickness of a little over a year, was admitted to this hospital with an extensive involvement of the lower limbs by this disease. The knees and hips were dislocated and ankylosed. The ankles and tarsal joints were also involved, but to a less extent. The patient was bedridden. The pain on the slightest movement was excruciating. As the patient showed no improvement after three months of treatment, was rapidly becoming emaciated, and as there was no diminution in the associated pains, it was decided to amputate both legs at middle of thigh. This was done, with marked improvement in his general condition, the pains disappearing from the hip joints. He rapidly gained weight and was completely relieved from all troublesome symptoms, the disease passing into a quiescent stage. The differential diagnosis between articular rheumatism and arthritis deformans is one of the most interesting problems encountered here. In addition to the usual differential signs, we always examine the joints of the hands with the X-ray to determine any necrosis or abnormal process in the joint itself. This method has proved of value at times, the radiographs often showing an involvement of the joint by arthritis deformans when the clinical tests were not conclusive.

In the treatment of these affections during the past six months the method of baking the joint in a hot-air apparatus has been employed with most gratifying results. Arthritis deformans shows marked and rapid improvement. The pain is relieved and the movements of the joint increased to an extent not obtained by massage and medicines. Gonorrheal rheumatism also improves rapidly under this method. It is of value in the myalgic form, though here it is of very limited application, as the part affected is so often situated where it is impossible to thoroughly bake it. No case of simple articular rheumatism in the chronic stage was materially benefited by the method.

Diseases of the nervous system comprise another class of cases, of interest mainly from the obscure problems in diagnosis which they present. *Tabes dorsalis* is the most common, and frequently shows unusual manifestations. Its onset as a rheumatoid affection is of course very common. In two cases the mode of onset was very rare. They were both admitted to the hospital for gastralgia, and a careful examination exhibited the fact that they were suffering from an attack of gastric crisis. In one of the cases the crisis occurs every four to eight weeks and lasts from two to ten days, the patient often sinking so low as to appear moribund. Another rare feature of the disease occurring in one case is the joint condition described by Charcot. In this case the arthropathy affects both knees and is of the hypertrophic form. Both joints are greatly enlarged, almost to twice their original size, the enlargement occurring in both bones entering into the articulation, but being more pronounced in the femur. Another case showed that the process had also involved the lateral columns of the cord, giving rise to the group of symptoms described by Gowers as ataxic paraplegia.

Paralysis agitans and the more moderate degenerations associated with old age are not infrequent. A few cases of insular sclerosis are met with. Myelitis and neuritis are seen among the younger men, as a sequence to various fevers. One case of special interest is that of a man who on admission, nine months ago, had the signs of a chronic myelitis, which, from the progress of the symptoms since admission, is becoming more and more disseminated and tending toward the classical signs of syringomyelia. More or less mental weakness and instability are seen in at least 5 per cent of the recent admissions to the Home, but it appears to be rather a hereditary taint than due to the tropical service, except in a very few cases where it is directly traceable to a sunstroke.

Among the men who have seen service in tropical countries a chronic form of dysentery is frequently seen. The stools are usually of a watery character, containing more or less mucus, but no blood. Intestinal indigestion and flatulence are invariably associated with it. The stools were carefully examined in all cases, but the cause of the disease was found in only three out of twenty-one cases. The *amœba dysenteriae* was present in one case. After two months' treatment the organism disappeared, and the patient has had no signs of the disease for about nine months. In two cases the *anguillula stercoralis*, a form of the *strongyloides intestinalis*, was present. One of the cases was discharged as recovered after four months residence here, none of the parasites having been found during the last three months. In the other case the parasite is still present two months after admission, but in fewer numbers. The general condition of the patient shows very marked improvement. Cultures were made in nearly all cases, but with negative results. Shiga's bacillus was not obtained from a single case, nor did the bacillus give an agglutinative reaction with the patient's blood serum. In the bacteriological examination of the stools the method was pursued of isolating an organism from the stool which would agglutinate with the patient's serum, but in no case was it successful.

In surgery during the past year there have been 51 operations. Adenitis inguinalis, hemorrhoids, varicose veins, and hernia comprise the majority of the cases. There were 5 cases of hernia operated upon. In 3 cases the Bassini operation was performed, with a perfect recovery and no recurrence. In 2 cases the Halsted operation was performed, in one of which there was a recurrence at the outer point of the incision, but as the patient left the hospital without permission and went at hard work in three weeks, the blame rests with him rather than with the operation. A case of great interest was that of two simultaneous operations on a man 78 years old. The man was suffering with a cancer of the penis and a large right inguinal hernia. A typical Halsted hernia operation was performed; the penis was amputated at the scrotal junction. There has been no recurrence of the hernia and no metastasis from the cancer.

A case of interest on account of its rarity was a cancer of the right breast in a male. The tumor was first noticed seven months before admission, but had given no trouble except slight pain in that breast, shooting to axilla. At the time of admission the growth was about the size of a walnut, lying just above and outside the nipple and not attached to the skin. The nipple was not retracted but was not as freely movable as the left nipple. In the right axilla there were three small glands palpable, one the size of a large hazelnut. The lower part of the pectoralis major muscle and the axillary glands were removed. Patient made an uninterrupted recovery. Microscopical examination showed an adeno-carcinoma of the breast, with metastases to the axillary glands.

Medullary narcosis was employed in four cases, in three of which there was a contraindication to the use of ether or chloroform on account of the condition of the kidneys and lungs. Complete analgesia and partial anesthesia, extending up to the nipple line, were obtained in two cases. In these two, one a hernia and the other

an excision of varicose veins, the operation was painless. In the third case, an excision of a tuberculous sinus from the perineum, only partial analgesia extending up to the umbilical zone was obtained, and there was a little pain experienced during the operation. In the fourth case, amputation of the right thigh, anesthesia and analgesia were obtained over the leg and back of thigh. After injecting a maximum dose of the cocaine solution into the spinal canal and no extension of the analgesia resulting, the method was given up and chloroform resorted to. Of the four cases three were successful. The fourth case was a failure, although the injection was made directly into the spinal canal, as was shown by the escape of spinal fluid through the needle.

Diseases of the ear.—The most common trouble with this organ has been due to accumulation of wax in the external auditory meatus, usually easy of removal by boric-acid syringing, but occasionally inspissated and requiring the use of an instrument. All such cases have been improved and where the drum was not injured have permanently recovered. Otitis media has occurred rarely, not more than 10 cases having presented themselves. None have required paracentesis. Inflation with the Pulitzer bag and postnasal douches have cured all the acute ones, and in several of the chronic character there has been permanent improvement. Eczema of the meatus has been seen three times, easily remedied by salicylic acid ointment. There was one case of polypus of tympanum, but the patient would not submit to an operation. Several cases of concussion leading to deafness of greater or less degree were not benefited by treatment.

Diseases of the nose.—Most of these cases were catarrhal and nearly all chronic. The acute case recovered; the chronic cases were all improved by local and systemic treatment. Nasal polypi were found in five cases, two of which were far advanced, and in both over 20 polypi of various sizes were removed by the cold snare method. In one of these there has been no return of the growth; the other case is still under treatment. Only one case of tuberculosis was seen. The focus was scraped and nitrate of silver applied with good effect. Unfortunately the man left the Home too early to judge the ultimate result. Syphilis has not occurred, except in so far as perforate septum is concerned. Two such cases were noted. Hypertrophic rhinitis is rather more common than the atrophic form. Hay fever is seldom seen, only one case appearing at the clinic. Deflections of the septum are not frequent, but three well-marked cases were seen, and all refused operation.

Diseases of the throat and larynx.—There have been about 10 cases of tonsillitis, usually of the follicular type. One case only developed peritonsillar abscess, and was lanced, with prompt recovery. One case of chronic syphilitic enlargement of the tonsils was seen. This patient was permanently relieved by antisyphilitic treatment. But 1 case of tumor of the larynx occurred. In this case there were 3 small wart-like growths on the true vocal cords, rendering the patient nearly aphonic. There was no pain and no sign of malignancy. Patient refused operation. Tuberculosis of the larynx occurred once. Inhalations of oxygen were tried with but little success. Foci gradually developed in the lungs, and patient was sent to Fort Bayard, N. Mex.

Diseases of the skin.—Simple eczema and eczema due to varicose veins are about equally common. Nearly all the former have recovered completely; the latter group are more refractory, but where an excision of the veins has been allowed in 3 cases the eczema has promptly disappeared in all but 1. Rhus poisoning has been seen in about 20 cases. All recovered. Erysipelas cases are 7 in number. These are usually taken in hospital. The face has been the seat of the process in all. A rather rare condition, erythema bullosum, developed in a patient under treatment for myxedema, who was taking thyroid extract (0.325 grams) three times a day. The eruption was limited to the backs of both hands and the wrists. Stopping the thyroid extract produced a decided change for the better, and the patient recovered in about two weeks. Later the extract was commenced again. In a few days 2 small erythematous patches appeared on either wrist about the styloid process of the ulna, but did not assume any bullous characteristics. Among other skin diseases treated here may be mentioned pediculosis corporis and pubis, tinea versicolor, urticaria, syphilitic eruptions of various kinds (usually macular), seborrhea, herpes zoster, folliculitis staphylogenes, dhobie itch, acne vulgaris, warts, callosities, and 1 case of multiple sarcomatosis where there were 40 or 50 small tumors seen on different parts of the body, but mostly on the face and neck. There was 1 case also of lupus vulgaris, easily cured by curettage.

Diseases of the eye and anomalies of refraction form an interesting feature of the clinical work of the Soldiers' Home. The pathological conditions include nearly all those known to the ophthalmologist. In the blind room at the Scott Building there are 4 cases of total blindness and 19 cases of partial blindness from various causes, such as detachment of the retina, atrophy of the optic nerve, cataract, glaucoma,

retinitis pigmentosa, etc. The errors of refractions are numerous, taking into consideration the fact that they are found in a class of men whose vision was considered normal at enlistment. The number whose latent hyperopia has become manifest after 40 and 45 is surprisingly large, a fact that reveals the flaws in our method of examination in spite of its rigid requirements. Prescriptions were written during the year to correct presbyopia and all the anomalies known under refractive errors.

Gunshot wounds.—The remote effects which occurred in gunshot wounds from the old caliber bullet in the pre-antiseptic era, due to retained projectiles, pieces of clothing, etc., and long-standing suppuration associated with necrosis, are virtually absent in the recent cases. There have been 42 cases of gunshot wounds admitted here during the past two years. They have been distributed to the various regions and structures of the body as follows: Head, 4; chest, 4; arm, 3; forearm, 8; hand, 1; thigh, 8; leg, 4; foot, 4; joints, 9; hip, 2; knee, 3; ankle, 3, and elbow, 1. Three of the cases were struck by 2 bullets each, making 45 wounds in all. Four cases showed multiple wounds, in three of which the ball, after passing through the arm, lodged in the body, the position being unknown in 2 cases. In the third case the ball entered the chest wall between the sixth and seventh ribs, in the mid-axillary line, and passed downward, lodging above the hip joint.

The projectile was of the small caliber type in 37 cases, 27 being Mausers, 6 were Krag-Jørgensens, and 4 were unknown. Large-caliber projectiles occurred in 8 cases, 5 being brass-jacketed Remington, 2 were lead bullets of a similar caliber, and 1 was unknown. Five of the cases resulted from bullets deformed by ricochet.

The distance from the firing line of the enemy was unknown in 12 cases, above 500 yards in 21 cases, and under 20 feet in 4 cases. Of the last group of cases mentioned in 2 the projectile passed through cancellous bone and made simple perforation; in another case the projectile struck a little above the ankle, literally blowing the leg off and necessitating immediate amputation.

The remote effects are chiefly pain, soreness or tenderness in the region of the wound, with more or less weakness and some impairment of motion or paralysis, according to the structures involved and the extent of that involvement. Pain and soreness at the site of the wound occurred 25 times; extending peripherally from the wound, with symptoms or signs of a definite neuritis, 7 times; stiffness of the limb and impaired motion at the joint peripheral to the point of injury occurred 21 times. There was total paralysis of the limb peripheral to the lesion in 5 cases and partial paralysis in 9 cases. Deformities were observed in several cases as a result of the paralyzes, and in a few cases as a result of nonuse and faulty position.

Major La Garde closes his report with a number of cases of old gunshot injuries, illustrated by some excellent X-ray photographs, which have been sent to the Army Medical Museum.

ARMY MEDICAL MUSEUM.

The total number of specimens in the Army Medical Museum at the end of the fiscal year, June 30, 1901, was 34,988. The following statement shows in detail the additions and changes in the different sections.

Pathological section:

In museum June 30, 1900.....	11,877
Received during the year.....	276
In museum June 30, 1901.....	12,153

Anatomical section:

In museum June 30, 1900.....	1,540
Transferred to other institutions.....	3
Received during the year.....	1,537
In museum June 30, 1901.....	1,552

Section of comparative anatomy:

In museum June 30, 1900.....	1,432
In museum June 30, 1901.....	1,432

Microscopical section:	
In museum June 30, 1900.....	12,891
In museum June 30, 1901.....	12,891
Miscellaneous section:	
In museum June 30, 1900.....	2,494
Received during the year.....	40
In museum June 30, 1901.....	2,534
Provisional pathological section:	
In museum June 30, 1900.....	2,058
Discarded.....	1
Transferred to other institutions.....	731
	732
In museum June 30, 1901.....	1,326
Provisional anatomical section:	
In museum June 30, 1900.....	756
Transferred to other institutions.....	78
In museum June 30, 1901.....	678
Photographic series:	
In museum June 30, 1900.....	2,372
Received during the year.....	50
In museum June 30, 1901.....	2,422

RECAPITULATION.

Specimens in museum June 30, 1900.....	35,420
Discarded and transferred.....	813
	34,607
Added during the year.....	381

Specimens in museum June 30, 1901..... 34,988

The following are some of the more interesting specimens received during the fiscal year:

12143. Double human monster, from San Juan, Porto Rico. Contributed by Capt. J. L. Vina, United States Volunteers.
12120. The Texas screw worm, which carries the Texas cattle-fever germ. Contributed by Capt. J. H. Stone, assistant surgeon, United States Army.
- 12038-12044, 12005, 12073-12077, 12083, 12084, 12087-12090, 12093-12101, 12106-12109, 12242, 12243, 12246. Specimens from cases of bubonic plague. Obtained in Manila, P. I., by Dr. E. R. Hodge.
- 12035-12037, 12052-12055, 12061-12064, 12069-12072, 12110-12117. Specimens from cases of leprosy. Obtained in Manila, P. I., by Dr. E. R. Hodge.
- 12049-12051, 12091, 12250-12253. Specimens from cases of beri-beri. Obtained in Manila, P. I., by Dr. E. R. Hodge.
- 12247-12249, 12255, 12256. Specimens from cases of chronic amebic dysentery. Obtained in Manila, P. I., by Dr. E. R. Hodge.
- 12254, 12257, 12258. Specimens from cases of acute specific dysentery. Obtained in Manila, P. I., by Dr. E. R. Hodge.
- 12056, 12085, 12086. Spleen and kidney from cases of pernicious malarial fever. Obtained in Manila, P. I., by Dr. E. R. Hodge.
- 11987-11990. General tuberculosis in a soldier who had contracted dysentery in Manila, P. I. There were perforating tubercular ulcers of ileum and appendix, girdle ulcers of large intestines, tubercular ulcers of urinary bladder, tubercles of lungs, liver, mesenteric glands, and kidneys. The heart was unusually small—but 200 grams. Contributed by Lieut. Col. A. C. Girard, deputy surgeon-general, United States Army.
12206. Plaster cast of face of the late William H. Seward, taken after the attempted assassination, showing facsimile of apparatus applied for fracture of jaw. Contributed by J. A. Bishop, D. D. S., New York, N. Y.

12154. Fragment of skull found lying against the brain forty-four years after shot fracture. No sequelæ of the injury. Contributed by Dr. J. Ford Thompson, Washington, D. C.
12031. Direct and indirect shot fracture of lower jaw of dog. Contributed by Dr. Cecil French, Washington, D. C.
- 12142, 12020. Two cases of shot fracture of thoracic vertebrae in soldiers. 12142, death occurred thirty hours after injury. Contributed by Dr. A. S. Kennedy, contract surgeon, United States Army. 12020, death occurred almost instantaneously from hemorrhage. Contributed by Lieut. A. E. Truby, assistant surgeon, United States Army.
- 12027, 12028. Two cases of sarcoma of bone and amputation. 12027, of the ulna of a girl of 14; contributed by Dr. W. M. Gray, Washington, D. C. 12028, of the humerus of a man, age 58; contributed by Dr. A. A. Snyder, Washington, D. C.
12201. Repeated trephining of temporal bone in case of otitis media and sigmoid sinusitis. Death. Contributed by Dr. E. O. Belt, Washington, D. C.
12129. Hemorrhagic separation of layers of dura mater. Contributed by Dr. D. S. Lamb, Washington, D. C.
12155. Mummified brain of Mound Indian of two hundred years ago, showing convolutions. Contributed by Mr. Clarence B. Moore, Philadelphia, Pa.
- 12016 and 12193. Glioma of brain removed from man, age 28. Two operations. Recovery, with partial use of muscles. Contributed by Dr. D. P. Hickling, Washington, D. C.
- 12161, 12162. Meningitis and endocarditis following pneumonia, and caused by diplococcus pneumoniae. Contributed by Dr. D. S. Lamb, Washington, D. C.
12018. Fatal cancer of pleura, secondary to cancer of breast, which had been removed. Woman, age 68. Contributed by Dr. I. H. Lamb, Washington, D. C.
- 12032, 12033. Fatal pericarditis in a cow, caused by the passing of a piece of wire from stomach to pericardium. Contributed by United States College of Veterinary Surgeons, Washington, D. C.
12017. Rupture of fatty heart of man, age 65. Contributed by Dr. W. E. Whitson, Washington, D. C.
- 12182, 12183. Hypertrophy of heart and thyroid gland. From a case of general tuberculosis. Contributed by Dr. D. S. Lamb, Washington, D. C.
- 12013, 12176. Two cases of aneurism of arch of aorta, in which wire was introduced with temporary benefit. 12013, from a man, age 40. Contributed by Dr. W. W. Johnston, Washington, D. C. 12176, a man, age 55. Contributed by Dr. H. A. Robbins, Washington, D. C.
12147. Rupture of spleen in a soldier. Cause unknown. Contributed by Capt. D. C. Howard, assistant surgeon, United States Army.
12003. Plaster cast showing operation for cleft palate. Contributed by Dr. Thomas Fillebrown, Boston, Mass.
12131. Odontoma, weighing 5½ ounces, from jaw of a young steer. Contributed by Dr. John S. Marshall, Chicago, Ill.
12132. Cementoma, weighing 59 ounces, from jaw of a 2-year-old colt. Contributed by Dr. John S. Marshall, Chicago, Ill.
12261. Side of face removed, post mortem, from case of noma. Contributed by Major L. C. Carr, brigade surgeon, United States Volunteers.
11995. Salivary calculi (lime phosphate and organic matter), from abscess near Wharton's duct. Contributed by Capt. A. E. Bradley, assistant surgeon, United States Army.
- 12139, 12184. Two cases of fatal hemorrhage from stomach. 12139, from a man, age 47; multiple erosions of mucous membrane. Contributed by Dr. M. A. Parsons, Washington, D. C. 12184, from a dog; stomach deeply congested. Contributed by Dr. Cecil French, Washington, D. C.
12034. Gastro-enterostomy in a man, age 45; for cancer of stomach. Death on sixth day. Contributed by Dr. I. S. Stone, Washington, D. C.
- 11996-12002. Experimental hog cholera. Portions of ileum and colon, showing congestion, thickening, necrosis, and grayish false membrane (mucosa). The hogs were fed, some with bacillus cholerae suis, others with bacillus icteroides (Sanarelli). Contributed by Maj. Walter Reed, surgeon, United States Army, and Contract Surgeon James Carroll, United States Army.
12158. Inguinal hernia in a dog, which occurred just after labor. The sac included both intestine and uterus. Contributed by Dr. Cecil French, Washington, D. C.
12174. Fatal hemorrhage from small intestine in influenza. Contributed by Dr. M. A. Parsons, Washington, D. C.

12183. Fatal purulent peritonitis in intestinal obstruction, the cause of which had disappeared at post mortem. Man, age 45. Contributed by Dr. D. S. Lamb, Washington, D. C.
- 12011, 12173, 12177. Three cases of cancer of head of pancreas. 12011, from a man, age 49. Contributed by Dr. D. G. Lewis, Washington, D. C. 12173, man, age 73. Contributed by Dr. Amelia Erlach. 12177, man, age 65. Contributed by Dr. D. S. Lamb, Washington, D. C.
- 11991, 11992. Gas bacillus dilatation of liver. Contributed by Dr. James Carroll, contract surgeon, United States Army.
12148. Liver of yellow fever. Contributed by Dr. James Carroll, contract surgeon, United States Army.
12078. Hydatid cysts of liver. Contributed by Dr. E. R. Hodge, Washington, D. C.
12105. Subperitoneal hemorrhage of liver in typhoid fever. Contributed by Dr. E. R. Hodge, Washington, D. C.
12124. Hydronephrosis in a new-born child. Contributed by Dr. T. C. Smith, Washington, D. C.
12198. Successful nephrectomy, for renal tuberculosis. Man, age 20. Contributed by Dr. E. J. Whitehead, Columbiana, Ohio.
12014. Miliary tuberculosis of kidney in boy, age 3 years. Contributed by Dr. J. Ford Thompson, Washington, D. C.
12200. Prostatectomy; removal of 165 grams of the gland. Man, age 56. Death on fifth day. Contributed by Dr. A. A. Snyder, Washington, D. C.
- 12137, 12138. Abscess of Fallopian tube and ovary, followed by fatal purulent pericarditis. Woman, age 19. Contributed by Dr. D. S. Lamb, Washington, D. C.
12019. Human ovum of 11 weeks, which was conceived after bi-lateral ligation of Fallopian tubes. Contributed by Dr. W. A. Frankland, Washington, D. C.
12135. Placenta velamentosa. Contributed by Dr. V. E. Watkins, contract surgeon, United States Army.
12241. Fibro-sarcoma removed from abdominal wall of soldier. Contributed by Capt. H. M. Hallock, assistant surgeon, United States Army.
- 12007-12008. Two specimens of keratolysis. 12007, from man, age 50, who had been a soldier eleven years and was discharged because of the disease. Had had it since early infancy. Contributed by Dr. R. M. Stone, Omaha, Nebr. 12008, from a woman, age 60, who had had the disease seventeen years. Contributed by Dr. E. W. Reisinger, Washington, D. C.
12157. Remarkable cuticular hypertrophy of hoof of horse, following laminitis. Contributed by United States College of Veterinary Surgeons, Washington, D. C.
- 12207-12240. Series of models showing diseases of skin, mainly the rarer forms. Prepared by J. Baretta, Paris.

LIBRARY OF THE SURGEON-GENERAL'S OFFICE.

The following table shows the additions made to the library during the fiscal year 1900-1901:

Description.	On hand June 30, 1900.	Added dur- ing fiscal year.	Total, June 30, 1901.
	Volumes.	Volumes.	Volumes.
Medical journals.....	40,418	1,463	41,881
Medical transactions.....	6,292	367	6,659
Bound theses.....	2,054	80	2,134
Bound pamphlets.....	2,754	51	2,805
Other medical books.....	84,877	2,683	87,560
Total.....	135,895	4,644	140,539
Medical theses.....	62,138	1,766	63,894
Medical pamphlets.....	166,379	6,455	172,834
Total.....	228,517	8,221	236,728

Of the total number of theses on hand June 30, 1900, there were 1,093, bound in 80 volumes, and 275 pamphlets, bound in 43 volumes, during the year.

There were presented to the library during the year 483 books and 9,291 pamphlets and journals.

Volume VI, second series, of the Index-Catalogue includes the letters G and H from G to Hernette, and forms a volume of 1,051 pages. It will be ready for distribution at the usual time. The appropriation for Volume VII, second series, having been made, the manuscript is in course of preparation for the printer.

MEDICAL OFFICERS.

UNITED STATES ARMY.

The total number of regular medical officers allowed by law under the Army reorganization act (approved February 2, 1901) is 321; number in service June 30, 1901, 245; number of vacancies on that date, 76.

Appointments.—Fifty-seven appointments as first lieutenants and assistant surgeons were made during the year with one appointment as captain and assistant surgeon, the incumbent in this special case having been retired on the date of his appointment.

Promotions.—Five officers were promoted from lieutenant-colonel and deputy surgeon-general to colonel and assistant surgeon-general; 8 from major and surgeon to lieutenant-colonel and deputy surgeon-general; 20 from captain and assistant surgeon to major and surgeon; and 5 from first lieutenant and assistant surgeon to captain and assistant surgeon.

Retirements.—Three colonels and assistant surgeons-general and 2 captains and assistant surgeons (retired with the rank of major).

Deaths.—One colonel and assistant surgeon-general, 2 majors and surgeons, and 1 first lieutenant and assistant surgeon.

Resignation.—One first lieutenant and assistant surgeon.

The appointments were made on the recommendation of examining boards in session in San Juan, P. R.; Manila, P. I.; Washington, D. C.; and San Francisco, Cal.

Summary of work of the Army medical board convened in San Juan, P. R., on August 6, 1900.

Number of candidates invited to appear.....	7
Approved.....	2
Physically disqualified.....	2
Rejected.....	1
Withdrew.....	2

Summary of work of the Army medical board convened in Manila, P. I., on April 16, 1900.

Number of candidates invited to appear.....	154
Declined to appear.....	1
Number of candidates examined.....	153
Approved.....	¹ 46
Physically disqualified.....	33
Rejected.....	29
Withdrew.....	45

¹ Includes 16 mentioned in last annual report, 1 of whom died before appointment.

Summary of work of the Army medical board convened in Washington, D. C., on February 11, 1901.

Number of candidates invited to appear.....	191
Declined to appear.....	19
Failed to appear.....	45
Requirements unfulfilled.....	1
Number of candidates examined.....	126
Approved.....	21
Physically disqualified.....	45
Rejected.....	51
Withdrew.....	9

Summary of work of the Army medical board convened in San Francisco, Cal., on February 11, 1901.

Number of candidates invited to appear.....	19
Declined to appear.....	5
Failed to appear.....	5
Number of candidates examined.....	9
Approved.....	4
Physically disqualified.....	1
Withdrew.....	4

It is gratifying to note that although the percentage of candidates approved by the boards recently in session is 24.84 as compared with 19.23 approved by the boards in session during the ten years 1889-1898, inclusive, there has been no lowering of the standard of admission. So many of the recent candidates were young men who had proved their capabilities, physical and professional, by one or more years of active service as volunteer or contract surgeons that the ratio of successful candidates was necessarily higher among them than among the young medical graduates who came before the earlier boards. Few of those who appeared before the board in session in Washington, D. C., had previous service, and among them the ratio of approved candidates was only 16.67 per cent as compared with 19.23 per cent during the decade cited.

The following table shows the comparative work of these boards:

Statistics of examinations by Army medical boards held during the ten years from January 1, 1889, to December 31, 1898, compared with those held during 1900 and 1901.

[NOTE.—There were no examinations during 1899.]

Boards.	Invited.	Declined to appear.	Failed to appear.	Requirements unfulfilled.	Number examined.	Approved.	
						Number.	Percent.
1889-1898.							
Total, 10 years.....	639	24	121	.....	494	95	19.23
1900.							
Havana, Cuba.....	16	.....	1	.....	15	4	26.67
San Juan, P. R.....	7	.....	.....	.....	7	2	28.57
1900-1901.							
Manila, P. I.....	154	1	.....	.....	153	46	30.06
1901.							
Washington, D. C.....	191	19	45	1	126	21	16.67
San Francisco, Cal.....	19	5	5	.....	9	4	44.44
Total, 1900-1901.....	387	25	51	1	310	77	24.84

Statistics of examinations by Army medical boards, etc.—Continued.

Boards.	Physically disqualified.		Rejected. (Other causes than physical.)		Withdrawn.		Ratio approved to—	
	Number.	Per cent.	Number.	Per cent.	Number.	Per cent.	Physically disqualified.	Rejected and withdrawn.
1889-1898.								
Total, 10 years	127	25.71	198	40.08	74	14.96	1 : 1.34	1 : 2.86
1900.								
Havana, Cuba			10	66.67	1	6.67	1 : 0	1 : 2.75
San Juan, P. R.	2	28.57	1	14.29	2	28.57	1 : 1	1 : 1.50
1900-1901.								
Manila, P. I.	33	21.57	29	18.96	45	29.41	1 : 0.71	1 : 1.61
1901.								
Washington, D. C.	45	35.71	51	40.48	9	7.14	1 : 2.14	1 : 2.86
San Francisco, Cal.	1	11.11			4	44.44	1 : 0.25	1 : 1
Total, 1900-1901	81	26.13	91	29.35	61	19.68	1 : 1.06	1 : 1.97

MEDICAL OFFICERS OF VOLUNTEERS.

All medical officers of the volunteer staff appointed under the Act of Congress approved March 2, 1899, were mustered out of service on June 30, 1901, and all regimental surgeons and assistant surgeons were mustered out on the same date, except the medical officers of the Forty-seventh Infantry, United States Volunteers, who were mustered out on July 2, 1901.

Under the Act approved February 2, 1901, there were appointed for service in the Division of the Philippines 50 surgeons with the rank of major (of whom 8 are captains and assistant surgeons, United States Army), and 150 assistant surgeons with the rank of captain. One major and surgeon and 2 first lieutenants and assistant surgeons died during the year.

CONTRACT SURGEONS, UNITED STATES ARMY.

There were in service June 30, 1900, 462 contract surgeons. During the year ended June 30, 1901, contracts were made with 265 physicians; 333 contracts were annulled and 7 terminated by death, leaving in service June 30, 1901, 387 under contract. Of this number 106 were on duty in the United States, 17 on transports, 14 in Cuba, and 250 in the Philippine Islands.

The following tabulation shows the number of contracts with physicians made from April 17, 1898, to December 31, 1900, classified by length of service:

	Out of service.	In service.	Total.
Served under one month	36	4	40
Served one to six months	342	132	474
Served six to twelve months	143	99	242
Served one to two years	119	115	234
Served over two years	27	179	206
Total	667	529	1,196

Total number serving in 1898	771
Daily average serving in 1898	344
Total number serving in 1899	670
Daily average serving in 1899	412
Total number serving in 1900	658
Daily average serving in 1900	482

Average service of the 667 out of service, seven months, twelve days.
 Average service of the 529 in service, one year, four months, fourteen days.
 Average service of the 1,196 contract surgeons, eleven months, twelve days.

The seven who died during the fiscal year 1900-1901 were: Charles Roemmelt, July 20, 1900, malarial fever; Frederick W. Hulseberg, August 1, 1900, killed by insurgents; Jesse W. Lazear, September 25, 1900, yellow fever; Charles A. Ross, February 2, 1901, killed by insurgents; James A. Rabbett, February 20, 1901, eruptive fever; Sherman A. Yule, March 4, 1901, nephritis; Charles St. John, May 22, 1901, killed by insurgents.

CONTRACT DENTAL SURGEONS.

The corps of 30 contract dental surgeons authorized by the Act of Congress approved February 2, 1901, is in progress of formation. Up to June 30, 1901, only 17 had been employed, and 3 of these were the supervising dental surgeons who constituted the examining board for this service. Of the 14 who passed the examining board and were given contracts for three years, 1 was assigned to the Department of Cuba, 11 to the division of the Philippines, and 2 were stationed at posts in the United States.

ARMY MEDICAL SCHOOL.

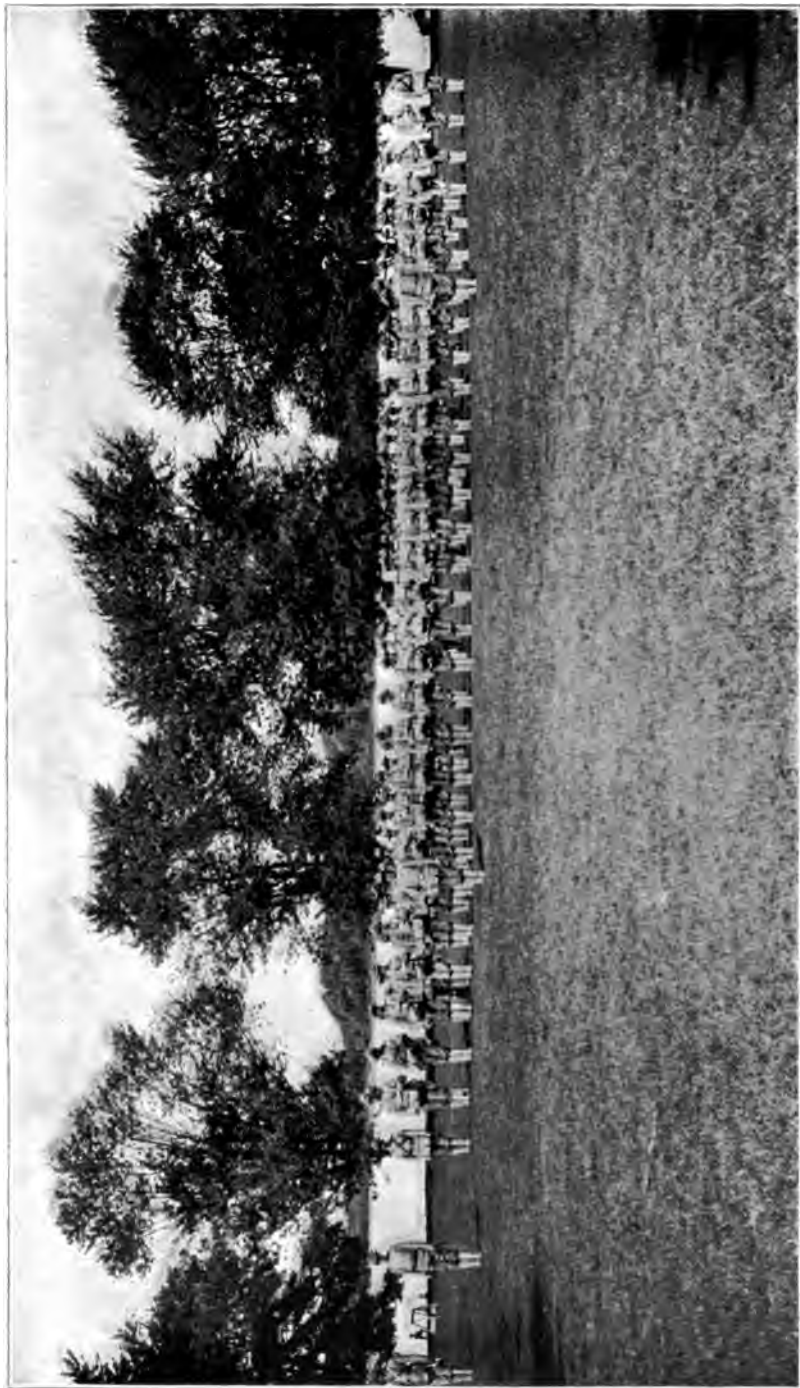
Existing conditions in the army medical department rendered it impracticable to carry out the usual school programme during the session of 1900-1901.

THE HOSPITAL CORPS.

On June 30, 1900, the Hospital Corps consisted of 167 hospital stewards, 381 acting hospital stewards, and 3,543 privates, a total of 4,091 enlisted men. During the fiscal year ending June 30, 1901, the corps gained by enlistment and reenlistment 844, by transfer from the line 221, by surrender from desertion 11, and by apprehension from desertion 6, a total of 1,082, and during the same period it lost 837 men, as follows: 417 by expiration of term of service, 137 by discharge by order, 47 by sentence of general court-martial, 97 by discharge on surgeon's certificate of disability, 16 by retirement, 16 by retransfer to the line, 63 by desertion, 2 killed in action, 36 by death due to disease, 3 by drowning, and 3 by suicide, leaving in service June 30, 1901, 246 hospital stewards, 388 acting hospital stewards, and 3,702 privates, a total of 4,336.

Hospital stewards.—The act of Congress approved May 26, 1900 (General Orders, No. 76, Headquarters of the Army, June 1, 1900), increased the number of hospital stewards by 100, making a total allowance of 200. There being an excess of 67 hospital stewards in service (remaining from those authorized during the Spanish-American war), only 33 vacancies required to be filled. An examination was held during August, 1900, for which 40 applications were received. Of this number 3 declined examination, 1 withdrew, 2 were not recommended by the examining board, 14 failed to pass, and 20 were found qualified and appointed.

To replace the loss of hospital stewards that would be occasioned by the muster out of the volunteer regiments, Congress (Act approved February 2, 1901) allowed an additional 100 hospital stewards (making a total of 300), "provided that men who have served as hospital stew-



COMPANY OF INSTRUCTION, HOSPITAL CORPS, GENERAL HOSPITAL, WASHINGTON BARRACKS, D. C., 1901

ards of volunteer regiments or acted in that capacity during and since the Spanish-American war for more than six months, may be appointed hospital stewards in the Regular Army; provided, further, that all men so appointed shall be of good moral character and shall have passed a satisfactory mental and physical examination." Fifty of the new appointments were allotted to the Division of the Philippines, and on February 16, 1901, the chief surgeon there was directed by cable to examine and recommend hospital stewards of volunteers and acting hospital stewards, Hospital Corps, United States Army, for promotion to the grade of hospital steward in the regular establishment. Upon his recommendation 27 candidates, who there successfully passed the required examination, were appointed up to June 30, 1901. To fill the remaining vacancies examinations were held in the United States, Cuba, and Porto Rico in March, 1901. Of the 60 applicants for these examinations, 5 declined, 2 failed to report, 13 were not recommended by the board, 9 failed to pass, 31 were passed; 30 were appointed, and 1 who had passed was discharged by expiration of service, not availing himself of this opportunity for promotion.

Acting hospital stewards.—Heretofore the examinations of privates of the corps for promotion to the grade of acting hospital steward were authorized directly by the Surgeon-General in each case. This method consumed considerable time and frequently caused delay in filling existing vacancies. To avoid this, department authorities were authorized to make these details, after examination as required by the regulations, without first requesting authority from the Surgeon-General, provided the allowance of acting hospital stewards and privates for each command be not exceeded, except by special authority of the Secretary of War. This has relieved this office of a considerable amount of work which is now quite as well done and with greater advantage to the service, in the offices of the different chief surgeons at the headquarters of the military departments. Questions for these examinations are prepared by the chief surgeon and copies thereof, as well as of the report of the examining board, are furnished the Surgeon-General in each case.

Recruitment.—Owing to an increased demand for men of the Hospital Corps for duty in the Division of the Philippines and with the China relief expedition, general recruiting officers and attending surgeons stationed at important points were granted authority, in July, 1900, to enlist desirable men for the corps, especially for foreign service, without reference to this office. The number required having been obtained, this general authority was withdrawn about September 10, 1900, and thereafter authority for enlistments was granted only in cases where men had previous service in the Army or were exceptionally desirable by reason of education, character, and physique.

To meet the current requirements of the corps, recruiting was resumed in the early part of January, 1901, and by the end of March a sufficient number of men had been enlisted for this purpose, when general recruitment was again suspended, and remains so up to the present time. Recruiting officers were cautioned to accept none but desirable men for the Hospital Corps, particular stress being laid upon the necessity for good education and physique, and waiving only slight deviations from the physical standard for vision in cases of young applicants in whom refractive errors could be entirely corrected by glasses. As a whole, the recruiting service for the corps has been

satisfactory, a very small percentage of recruits being found unfit for service after a trial of several months. All men enlisted for the Hospital Corps at rendezvous east of the Mississippi River were sent to the company of instruction, Hospital Corps, Washington Barracks, and others to the school at Fort McDowell, Angel Island, Cal. In addition to this source of supply, chief surgeons were authorized (letter of the Surgeon-General dated December 19, 1900) to enlist and reenlist men up to the regulation allowance of their departments without reference to this office. Up to the present but a small proportion of enlistments has been made in the departments, but it is hoped that presently matters will so shape themselves that the home departments will be able to take care of themselves, leaving to this office only the responsibility for the supply of commands outside the continent.

Distribution.—The number of posts and stations requiring the service of men of the Hospital Corps was about 146 in the United States, Cuba, and Porto Rico, and about 438 in the Division of the Philippines—the number varying more or less at short intervals; a total of about 568. In addition thereto, 7 arsenals and 4 general hospitals in the United States, 1 in the Hawaiian Islands, 1 in Japan (Nagasaki), and the hospitals in China, together with the transport service, had to be supplied with the necessary Hospital Corps personnel. To supply these stations and the great number of small field commands in the Division of the Philippines, the number of men of the Hospital Corps had to be somewhat increased during the fiscal year. A corresponding reduction is now gradually going on which will soon bring the number of men in the corps to the lowest percentage required by the distribution of the strength of the Army, now fixed at about 77,287, for which number it is estimated that 300 hospital stewards, 343 acting hospital stewards, and 2,571 privates; total, 3,214 will be sufficient. If, however, the Hospital Corps is expected to meet the sanitary requirements of the Porto Rican Provisional Regiment and 13,000 native troops authorized in the Philippines, its total strength can not be much less than 3,800.

The number of men of the Hospital Corps actually required in the different sanitary organizations has never been definitely laid down in regulations. Paragraphs 1409 and 1410, Army Regulations 1895, prescribed the number allowed to posts, which was based upon the number of companies constituting the garrison, rather than their strength, which is an uncertain quantity. In paragraphs 1605 and 1606, Army Regulations 1901, the allowance is based upon actual strength, and the proportion of noncommissioned officers is definitely established. It must be understood, however, that this applies only to the army in garrison. In active service the requirements will probably not be less than 5 per cent of the fighting effective.

The number and distribution of detachments of the Corps in the last quarter of the fiscal year were about as follows:

United States	118	Transports	19
Porto Rico	3	China	1
Alaska	7	Philippines	294
Cuba	18		
Hawaiian Islands	1	Total	461

Uniform and equipment.—In compliance with General Orders, No. 19, February 21, 1901, from the Headquarters of the Army, the insignia of the Hospital Corps was changed to conform to that of the Medical Department, following the custom obtaining in all other branches

of the service, where the insignia worn by the officer and enlisted soldier are identical in form. The arm brassards with the red cross remaining on hand will be available in any war with a signatory of the Geneva Convention for use in the field by all who may be neutralized by the terms of that convention. No change in equipment was made during the year, but to facilitate the transfer of fully-equipped men from one command to another, particularly in active service, paragraph 1604, Army Regulations, was promulgated. This paragraph prescribes the equipment and the method of transferring the accountability for it in changing stations. It is believed that this is a great improvement upon the regulation heretofore obtaining, which during the Spanish-American war was proved to be impossible to enforce.

In this connection, I would respectfully invite attention to the necessity for some change in the regulations governing descriptive lists, particularly in their application to the Hospital Corps. The very elastic organization of this body and the loose local attachment of its members, which are particularly apparent in active service, render necessary the adoption of some rule which will assure a reasonably intimate companionship between the man and his descriptive list.

During the year unusual attention has been given to the instruction of the men of the Hospital Corps, it being realized that a considerable part of the success of the department depends upon this important organization. Of the nearly 5,000 men now constituting the corps, a very large part entered the service since 1897, and but few of them, from the necessities of the situation, could receive the careful training given the sanitary soldier in our Army before the Spanish-American war. To be sure, they were no worse off in this respect than the men of the other branches of the service, but their individual responsibility is so much greater that lack of training became more apparent.

In a letter dated December 19, 1900, I indicated to the chief surgeons my desire to make them responsible, so far as practicable, for the recruitment, discipline, and instruction of the Hospital Corps in their respective departments, a plan which had recently been carried out with excellent results in the departments without the United States. I also directed that the provisions of paragraph 1413, Army Regulations 1895, as amended (par. 1609, A. R. 1901), should be strictly enforced and that a suitable course of instruction be prescribed covering five hours weekly, of which a report in detail should be submitted with the monthly return of the Hospital Corps.

During the year detachments of instruction were reestablished at the following-named stations: Fort Columbus, New York Harbor; Fort Sheridan, Ill.; Fort Snelling, Minn.; Fort Leavenworth, Kans.; Fort Sam Houston, Tex.; Fort Logan, Colo.; Vancouver Barracks, Wash.

Prior to April, 1898, detachments of instruction were maintained at some of the principal posts in the West. The withdrawal of troops during the Spanish American War caused not only a temporary cessation of instruction, but in most cases a discontinuance of these detachments. In the fall of 1900, surgeons serving at the above-named posts were notified to reestablish at once these detachments and the required course of instruction. To put the Department of the East on an equal footing with those of the West, six additional privates were allowed in December, 1900, to Fort Columbus for the pur-

pose of instruction and to meet any emergencies in that department. The course of instruction in these detachments was prescribed by chief surgeons who were especially charged with their supervision. No special reports regarding them have yet been received.

Schools of instruction. Schools of instruction were maintained at the Army General Hospital, Washington Barracks, D. C.; at McDowell, Cal. (Angel Island), and at Hospital No. 3, Manila. Most valuable work has been done in these organizations, which are now all running on a high plane of efficiency. As heretofore owing to the demands of the service abroad, especially the outbreak in China, not only were the companies of instruction in the United States depleted, but even the post detachments were temporarily reduced to the lowest practicable limits. The company of instruction at Washington Barracks, under command of Capt. E. J. Munson, assistant surgeon, United States Army, had thereafter but a nominal existence until recruiting was again begun. On March 1, when Maj. F. P. Reynolds, surgeon, United States Volunteers (assistant surgeon, United States Army), assumed command, the strength of the company had reached 183. The curriculum and interior economy of this school are set forth in the following report by Major Reynolds under date August 29, 1901:

I. LENGTH OF TIME THE COURSE OF INSTRUCTION IN THE SCHOOL SHOULD CONTINUE.

The course of instruction in this company has been one of three months at the end of which time the men were sent to San Francisco for foreign service. On the demand for men has been less, so that transfer at the end of the course has not been necessary in all cases. Advantage was taken of this to establish a fourth month or graduate class, and also to supply the hospitals with a liberal allowance of men who had been through the course of instruction.

For the last detachment ordered for foreign service it was therefore possible to select one-third of the men from the detachment on duty in the hospital and who had been under instruction for one month or more, and the remainder from the "graduate" class in the company.

It is my opinion that the course of instruction in a company of instruction should extend over at least four months. The instruction of the fourth month should be largely practical in character to firmly fix in the mind the theoretical instruction of the previous months by making a practical application of it.

There has been six hours' daily instruction, exclusive of Saturday and Sunday, during the summer months, about equally divided between outdoor and indoor work. During the remainder of the year the time will be reduced to five and one-half hours by reducing the amount of outside instruction. There has been no indication that these hours are too long or that better results would be obtained by a shorter day. With the exception of the occasional suspension or reduction of outside work during stormy or excessively hot weather or for field sports, this outline has been followed for the past six months. In stormy weather the hours for outside drill have been devoted to study.

II. CHARACTER OF INSTRUCTION.

The following outline of the present course of instruction in this company is submitted as embodying my ideas on the subject:

A. DAILY INSTRUCTION.

First three months:

Setting-up drill, all classes, daily, one-half hour.

Company drill, all classes, daily, one-half hour.

Bearer drill and field work, daily, first and second months, 1½ hours; third month, 1 hour.

Anatomy and physiology, daily, first month, 1 hour.

Nursing and ward management, daily, 1 hour, second month.

Bandaging, daily, first month, 1 hour.



REGIMENTAL FIELD HOSPITAL—FIELD EXERCISES, COMPANY OF INSTRUCTION, GENERAL HOSPITAL, WASHINGTON BARRACKS, D. C., 1901.

pose of instruction and to meet any emergencies in that department. The course of instruction in these detachments was prescribed by the chief surgeons who were especially charged with their supervision. No special reports regarding them have yet been received.

Schools of instruction.—Schools of instruction were maintained at the Army General Hospital, Washington Barracks, D. C.; at Fort McDowell, Cal. (Angel Island), and at Hospital No. 3, Manila, P. I. Most valuable work has been done in these organizations, which are now all running on a high plane of efficiency. As heretofore stated, owing to the demands of the service abroad, especially the sudden outbreak in China, not only were the companies of instruction in the United States depleted, but even the post detachments were temporarily reduced to the lowest practicable limits. The company of instruction at Washington Barracks, under command of Capt. E. L. Munson, assistant surgeon, United States Army, had thereafter but a nominal existence until recruiting was again begun. On March 16, when Maj. F. P. Reynolds, surgeon, United States Volunteers (assistant surgeon, United States Army), assumed command, the strength of the company had reached 183. The curriculum and interior economy at this school are set forth in the following report by Major Reynolds, under date August 29, 1901:

I. LENGTH OF TIME THE COURSE OF INSTRUCTION IN THE SCHOOL SHOULD CONTINUE.

The course of instruction in this company has been one of three months, at the end of which time the men were sent to San Francisco for foreign service. Of late the demand for men has been less, so that transfer at the end of the course has not been necessary in all cases. Advantage was taken of this to establish a fourth month or graduate class, and also to supply the hospitals with a liberal allowance of men who had been through the course of instruction.

For the last detachment ordered for foreign service it was therefore possible to select one-third of the men from the detachment on duty in the hospital and who had been under instruction for one month or more, and the remainder from the "graduate" class in the company.

It is my opinion that the course of instruction in a company of instruction should extend over at least four months. The instruction of the fourth month should be largely practical in character to firmly fix in the mind the theoretical instruction of the previous months by making a practical application of it.

There has been six hours' daily instruction (exclusive of Saturday and Sunday) during the summer months, about equally divided between outdoor and indoor work. During the remainder of the year the time will be reduced to five and one-half hours by reducing the amount of outside instruction. There has been no indication that these hours are too long or that better results would be obtained by a shorter day. With the exception of the occasional suspension or reduction of outside work during stormy or excessively hot weather or for field sports, this outline has been followed for the past six months. In stormy weather the hours for outside drill have been devoted to study.

II. CHARACTER OF INSTRUCTION.

The following outline of the present course of instruction in this company is submitted as embodying my ideas on the subject:

SCHEDULE OF INSTRUCTION.

First three months:

Setting-up drill, all classes, daily, one-half hour.

Company drill, all classes, daily, one-half hour.

Bearer drill and field work, daily, first and second months, 1½ hours; third month, 1 hour.

Anatomy and physiology, daily, first month, 1 hour.

Nursing and ward management, daily, 1 hour, second month.

Bandaging, daily, first month, 1 hour.



REGIMENTAL FIELD HOSPITAL—FIELD EXERCISES, COMPANY OF INSTRUCTION, GENERAL HOSPITAL, WASHINGTON BARRACKS, D. C., 1901.

First aid, daily, second and third months, 1 hour.
 Diet cooking, daily, second month, 1 hour.
 Materia medica and pharmacy, daily, third month, 2 hours.
 Clerical work, twice a week, third month, 1 hour.
 Care of animals, twice a week, third month, 1 hour.
 Elementary hygiene, daily, first month, 1 hour.

Fourth month:

Setting-up drill, daily, one-half hour.
 Company drill, daily, one-half hour.
 Bearer drill, daily, 1 hour.
 Care of animals, twice a week, 1 hour.
 Materia medica and pharmacy, daily, 1 hour.
 Clerical work, daily, 1 hour.

Setting-up drill or calisthenics, as given here, consists of the usual setting-up exercises of the Infantry Drill Regulations, with the addition of a number of exercises taken from the Manual of Calisthenic Exercises devised by Lieutenant Koehler, master of the sword, at the United States Military Academy. Attended by all classes.

Company drill is attended by all classes and includes definitions, general principles, school of the soldier, the squad, and school of the company, including movements by platoons as laid down in Infantry Drill Regulations. Manual of arms, firings, and bayonet exercises are of course not included.

Bearer drill includes everything laid down in the Drill Regulations for the Hospital Corps. The course is graded and covers three months.

Bearer drill and field work.—All classes. First month: Drill Regulations, paragraphs 50-113. Recitations on these paragraphs. Duty of each member of the squad. Drill with unloaded litter. Drill with loaded litter.

Second month: Paragraphs 113-165. Recitations on these paragraphs. Loaded litter over obstacles. Loaded litter upstairs. Loaded litter downstairs. To load with reduced numbers. Improvisation of litters. To remove wounded without litters. To place patient on horseback. The use of the travois. Ambulance drill. To prepare and load ordinary wagons.

Third month: Tent drill and packing. Shelter tent. Clothing roll. First-aid work in the field.

The course of instruction of each month has been concluded with public field exercises, the preparation for which has occupied the drill hours of the first class during the last week of the course.

The concluding feature has been an exhibition of some work of the Medical Department in active service; a regimental field hospital has been established and all departments completely organized for work, including the preparation of light diets; the work of a brigade section of an ambulance company has been shown by the establishment and operation of dressing and ambulance stations.

These exercises have increased the men's interest in their work to a marked degree, and have been beneficial in many other ways. On each occasion there has been a considerable attendance of officers and their families and civilians from the city.

FIELD GRADUATING EXERCISES OF THE FIRST CLASS, APRIL 27, 1901.

1. Company drill, platoon formations, 10 minutes.
2. Litter drill, all classes, unloaded litter, 10 minutes.
3. Litter drill by classes, 20 minutes. First class: First aid in the field, search for wounded, method of exposing wounds, applying first-aid dressings, application of extemporized splints, transporting patient by litter and ambulance to dressing station. Second class: Litter drill with loaded litter; squads acting independently—upstairs, downstairs, obstacles; removing wounded without litters. Third class: Litter drill with unloaded litter (without slings); commands; change bearers; posts; loading patient on litter, and unloading.
4. Exhibition drill, manual of unloaded litter, by detachment for Pan-American Exposition.
5. Exhibition tent pitching, detachment for Pan-American Exposition.

FIELD EXERCISES, MAY 29, 1901.

1. Company exercises: (a) Calisthenic class (A. H. S. Howe, instructor). (b) Company drill.
2. Bearer drill by classes: (a) (First class:) Shelter-tent pitching. (b) (Second class:) Drill with loaded litter (A. H. S. Howe, instructor). (c) (Third class:) Exercises with triangular bandage (A. H. S. Eiseman, instructor.)

3. Practical field work by first and second classes—showing the work at the front by a brigade section of an ambulance company: (a) Establishment of a dressing station. (b) Establishment of an ambulance station. (c) The work on the firing line: First aid in the field, removing wounded by litter, on horseback, by blanket litter, and without litter by one or more bearers.

FIELD EXERCISES JULY 2, 1901.

1. Calisthenic class.
2. Company drill.
3. Bearer drill by second class.
4. Exercises with the triangular bandage by the third class.
5. Practical field work by the first class: (a) Establishment and organization of a regimental hospital. (b) First aid in the field.

Elementary anatomy, physiology, and hygiene are taught during the first month by demonstrations, lectures, and recitations. A skeleton and an excellent manikin are used.

Bandaging is also taught during the first month by one hour's practical work daily.

ANATOMY AND PHYSIOLOGY (FIRST MONTH).

[Text-books: Smart's Handbook for the Hospital Corps; Doty's Prompt Aid to the Injured.]

- 1, 2, 3. Anatomy of the skeleton. 4. The muscular system. 5. Review. 6. The nervous system. 7, 8, 9. The circulation of the blood. 10. Review. 11, 12. The respiratory system. 13, 14. The alimentary system. 15. Review. 16. Organs of excretion. 17. Organs of reproduction. 18. Organs of special sense. 19. Review. 20. General review.

BANDAGING (FIRST MONTH).

1. Figure of eight, gauntlet. 2. Spica of the thumb, spiral reverse of the upper extremities. 3. Spica of shoulder, single. 4. Spica of shoulder, double. 5. Spica of the foot, covering the heel. 6. Spiral reverse and figure of eight, lower extremity. 7. Spica of groin, single. 8. Spica of groin, double. 9. Barton's head bandage. 10. Velpeau bandage.

ELEMENTARY HYGIENE (FIRST MONTH).

1. Disinfection and contagious diseases (Smart, pars. 534-560; Doty, pars. 91-109).
2. Hygiene (Doty, pars. 207-222). 3. Field service (Smart, pars. 63-110; Soldier's Handbook, pars. 83-89).

DIET COOKING.

The course in diet cooking is given by Miss Elizabeth Stack, a professional nurse and dietist. Each member of the class during the month prepares the various articles of light diet as laid down in the Manual of Emergency Diet, devised by Captain Munson, assistant surgeon, United States Army.

The various ways of utilizing the articles of the travel, field, and garrison rations for the use of the sick form an important feature of this course.

NURSING AND WARD MANAGEMENT (SECOND MONTH).

[Text-book, Clara Week's Nursing.]

Nursing and ward management are also taught by Miss Stack.

1. Care and management of ward. 2. Beds and bed making. 3. Admission of patient, care of effects. 4. Observation of symptoms. 5. Thermometers, charting of temperature. 6. Observation and recording of pulse and respiration. 7. Baths and bathing. 8. Preparation of enemata and administration. 9. Disinfectants, care of utensils, sputa cups, bedpans, urinals, etc. 10. Medicine and its administration. 11. Preparation of patient for operation. 12. Treatment of inflammation, medical and surgical. 13. Asepsis, antisepsis. 14. Ward dressings, surgical and medical. 15. Ward emergencies. 16. Nursing in typhoid fever. 17. Nursing in contagious diseases. 18. Nursing in convalescence. 19. Dissolution, care of body, autopsy. 20. Review.

FIRST AID.

First aid is taught by lectures and recitations during the second month and by demonstrations and practical exercises during the third month.

First class: 1. Medical emergencies—Symptoms, diagnosis, general rules for emer-

gencies, common causes of unconsciousness, poisons. 2. Demonstrations and practical instruction in the treatment of sunstroke, burns, heat exhaustion, severe hemorrhage, smothering, foreign bodies, shock, wounds of all regions, fracture dressing, use of packet. 3. The use of the field equipment—Pouches, cases, chests, furniture. 4. Practical field work.

Second class: Recitations—Asepsis and antiseptics, shock, bruises, burns, freezing, hemorrhage, the first-aid packet, wounds and their treatment, sprains, extraction of teeth, fractures, dislocations.

Materia medica and pharmacy (third and fourth months).—Instruction in this course is given in a lecture room in which a complete dispensary has been fitted up. Some time is spent in teaching the use of apparatus, the appearance of crude drugs, salts, and official preparations.

In each class of about 25 men there have been 3 or 4 who, because of deficient education or intelligence, were unable to profit by the instruction given in this course. Such men are usually dropped at the end of the first week. A few others find the subject difficult to understand, become discouraged, and fall behind. They are encouraged to do the best they can, and they usually finish the course with a proficient mark or approximating proficiency.

The course is a thorough one, and with a few months' practical experience in a hospital dispensary aims to prepare on the subject a candidate for promotion to the grade of acting hospital steward.

The man who in other respects is qualified for the latter grade has no difficulty in comprehending the work of the course or in standing well in the examination at its completion.

MATERIA MEDICA (THIRD MONTH).

The instructor is a graduate pharmacist of considerable experience.

First week: 1. The medical supply table. 2. Classification of drugs on the medical supply table. 3, 4. Definitions. 5. Review.

Second week: 1. Oxygen, hydrogen, and water. 2. Acids (mineral). 3. Acids (organic). 4. Alkalies (potassium, sodium, lithium, ammonium). 5. Review.

Third week: 1. Magnesium, zinc, and iron. 2. Lead, copper, and silver. 3. Mercury. 4. Antimony, arsenic, and bismuth. 5. Review.

Fourth week: 1. Alkaloids. 2. Volatile oils. 3. Fixed oils and fats. 4. Animal products. 5. General review.

PHARMACY (THIRD MONTH).

First week: 1, 2. Metrology. 3, 4. Operations requiring heat. 5. Review.

Second week: 1, 2. Operations not requiring heat. 3. The United States Pharmacopœia, official preparations. 4. Aqueous solutions. 5. Review.

Third week: 1. Alcoholic solutions. 2. Percolation. 3. Oleaginous solutions. 4. Ethereal solutions. 5. Review.

Fourth week: 1, 2, 3. Solid preparations. 4. Formulæ. 5. Review.

PRACTICAL COURSE IN MATERIA MEDICA AND PHARMACY (FOURTH MONTH).

First week: 1. Care of a United States hospital dispensary. 2. Use of weights and measures. 3. Solution, simple, chemical, gaseous. 4. Operations requiring heat. 5. Review.

Second week: 1. Operations not requiring heat. 2. Percolation. 3, 4. Official liquid preparations. 5. Review.

Third week: 1, 2, 3, 4. Official liquid preparations. 5. Review.

Fourth week: 1. The prescription. 2. Incompatibility of drugs. 3, 4. Dispensing. 5. Review.

COURSE OF INSTRUCTION IN CLERICAL WORK.

Clerical work is taught by lectures, recitations, and the actual preparation of the different reports, returns, and records required to be made and kept at a post or field hospital. The course extends through the third and fourth months.

The nature, objects, and methods of preparation of the following reports are explained to the class and copies of the reports are examined and criticised.

Daily reports.—1. Morning report. 2. Morning report of Hospital Corps detachment. 3. Detachment sick report. 4. Posting of register of patients. 5. Correspondence and current work.

Weekly reports.—1. Weekly report of detachment.

Trimonthly return.—1. Ration return of detachment and patients subsisted on the ration.

Monthly reports.—1. Report of completed cases. 2. Return of Hospital Corps and means of transportation. 3. Report of physical examination of recruits. 4. Statement hospital-fund account. 5. Statement ice-fund account (at posts having ice factory). 6. Personal report of medical officers. 7. Personal report and post-office addresses of staff officers (G. O., 108, 1898). 8. Sanitary report. 9. Report of repairs of hospitals and hospital stewards' quarters. 10. Ration return for those rationed separately, requisition for fuel, forage, etc. 11. Pay rolls.

Bimonthly reports.—1. Muster rolls. 2. (Report of changes in detachment for preceding two months, rendered on the last day of each month the muster roll is not made out.)

Quarterly reports.—1. Ordnance return. 2. Return of clothing and general equipment (quartermaster), general hospitals only.

Yearly reports and returns.—1. Return of medical property. 2. Estimate of repairs to hospitals and hospital stewards' quarters. 3. Annual requisition for medical supplies.

Occasional reports and returns.—1. Report of epidemic diseases. 2. Report of record books. 3. Report of deaths and interments. 4. Report of change of status, Hospital Corps. 5. Inventory and inspection reports. 6. Report of sales at public auction. 7. Report of change of combination of office safe. 8. Special requisitions, invoices, and receipts, etc.

Instruction in care of animals (third and fourth months) is given at the stable. The members of the class are taught the uses of the horse equipment, to mount and dismount with and without saddle, to harness horses, to hitch them to the ambulance, etc.

There has not been opportunity to teach ambulance driving to the extent of making each man a competent driver.

CARE OF ANIMALS (THIRD AND FOURTH MONTHS, THREE TIMES A WEEK).

1. Grooming. 2. Handling. 3. Feeding. 4. Watering. 5. Care after exercise. 6. The halter. 7. Watering bridle. 8. Curb bridle. 9. Saddle. 10. Saddle blanket. 11. To mount without saddle. 12. Position of the trooper without saddle and with saddle. 13. Holding the reins. 14. To dismount without saddle. 15. To harness horses and to hitch to the ambulance. 16. Ambulance driving.

III. RECORDS OF INSTRUCTION.

Each instructor keeps in a class book a list of the members of the class from which he calls the roll. After a recitation or drill he enters in the class book the comparative standing of each man during the hour. At the end of each week the instructor turns in to the company office the relative marks of the members of his class during the week, where they are entered in the records and placed before the company commander for his information.

At the end of each month the weekly class standings are consolidated, the members of each class are graded, and the results published, with the markings attained in each subject.

FIRST MONTH.

Setting-up drill, daily, one-half hour.
Marching and bearer drill, daily, two and one-half hours.
Anatomy and physiology, daily, one hour.
Elementary hygiene, daily, one hour.
Bandaging, daily, one hour.
Articles of War (first week), Saturday, one hour.

Hours outside drill	3
Hours inside instruction	3
Total number of hours daily for five days	6

SECOND MONTH.

Setting-up drill, daily, one-half hour.
Marching and bearer drill, daily, two and one-half hours.
Ambulance drill, tent pitching, first aid, daily, one hour.
Emergency cooking, daily, one hour.
Diets for the sick, daily, one hour.
Nursing and ward management (practical), daily, one hour.

Hours, outside drill	3
Hours, inside instruction	3
Total number of hours, daily, for five days.....	6

THIRD MONTH.

Setting-up drill, daily, one-half hour.	
Bearer drill and field work, daily, one hour.	
Company drill, daily, one-half hour.	
First aid, daily, one hour.	
Elementary pharmacy, daily, one hour.	
Materia medica, daily, one hour.	
Clerical work, twice a week, one hour.	
Care of animals, twice a week, one hour.	
Hours, outside drill	2
Hours, inside instruction	4
Total number of hours, daily.....	6

FOURTH MONTH.

Calisthenics, one-half hour, daily.
 Company drill, one-half hour, daily.
 Bearer drill, one hour, daily.
 Care of animals, one hour, twice a week.
 Materia medica, one hour, daily.
 Pharmacy, one hour, daily.
 Clerical work, one hour, daily.

NONCOMMISSIONED OFFICERS' CLASS.

This class has been divided into two sections, one consisting of privates who are candidates for promotion to the grade of acting hospital steward, and the other section including the noncommissioned officers of the company.

The instruction of the candidates' class includes the following subjects:

Clerical work.—Practical instruction.

Mess management.—Practical instruction in the company mess.

Army regulations.—Recitations.

Drill regulations.—Hospital Corps. Recitations.

The course of instruction in the noncommissioned officers' section has included:

Drill regulations.—Hospital Corps and Infantry as far as they relate to the course of instruction in company drill. Recitations.

Army regulations.—Recitations.

IV. METHODS OF IMPARTING DISCIPLINE.

1. The standard of discipline in the company or the detachment should be equal to that maintained in any arm of the service. With the class of recruits which have been received here during the past six months such a standard may be exceeded. The methods of maintaining discipline should, of course, be the same as those of the line of the Army.

2. A most useful incentive to this end is to encourage in the men a feeling of pride in their corps, to guard its honor and reputation at all times, teaching them that delinquencies of anyone reflect on the entire organization and on each member of it, and consequently that it is the duty of each man to aid in bringing offenders to justice. An esprit de corps thus established has caused privates to report their comrades for untidiness and boisterous conduct while on pass, for appearing in public places with women of doubtful character, etc. For the establishment of this feeling the influence of noncommissioned officers is most important, and it is through it that the result is to be obtained.

"The greater the individuality you give to the soldier himself and to his company * * * the more he feels that his individual conduct is of importance."

3. It, of course, is understood that a satisfactory state of discipline can only be imparted by inspiring the men's respect and confidence in their officers, the result of conscientious and painstaking interest in everything that concerns a soldier's welfare.

"In an army the bestowal of praise is the greatest of all moral terms." A knowledge that the duty a soldier performs is observed by his officers, and that duty of any character conscientiously performed and meriting approval will receive it, has never failed to stimulate men in their efforts to accomplish the highest results.

4. For minor breaches of discipline several methods of punishment have been in use in this company. For a first offense it has been customary to inflict no punishment, but the man has been admonished and made to understand the position he has placed himself in, the danger he is taking of permanently injuring his record, etc. An appeal to the man's reason and sense of honor has seldom failed of good result. Confinement to quarters, denial of pass privileges, and extra (squad) drill have been the usual minor punishments. When summary court-martial trials have been necessary, the sentence of confinement has been avoided in cases where there had been no previous convictions.

The discharge, without honor, of three incorrigible and disreputable privates of the company had a most gratifying effect on discipline, and at the same time relieved the organization of its only troublesome members, whose bad conduct had reflected on all.

5. The influence of class standing and the rivalries it has created has had a beneficial effect in stimulating effort and encouraging all to do their best. Promotion has been largely dependent upon a man's class record. The improvised grade of lance acting steward has been utilized in rewarding excellence in studies and conduct, the appointment having been given before the man was qualified for examination for promotion.

V. PRACTICAL INSTRUCTION IN THE HOSPITAL.

I would suggest the following plan:

After the Hospital Corps recruit has completed his four months' course of instruction in the company he is transferred for "special duty" in a general or a large post hospital, to which is attached the company of instruction. The men on duty in the hospital are divided into the "permanent" and "temporary" forces.

1. The permanent force, consisting of noncommissioned officers and instructed privates who by reason of experience and other qualifications, are in charge of the various departments or subdivisions of the hospital organization. The permanent force should constitute about one-third of the hospital personnel, and each man should ordinarily retain the same duties at least three months. Also, in order not to cause confusion by interfering with the hospital routine, changes should affect but a part of the force at one time. The members of the permanent force also constitute the instructors of the temporary force.

2. The temporary force consists of men transferred from the company to the hospital for instruction. The transfers are to take place monthly, the men being distributed throughout the hospital. Their service while in the hospital should be about as follows:

- Two months in the medical wards, the second month as senior or head nurse, if practicable.
- Two months in the surgical wards, including service in the operating and dressing rooms.
- Two months in the dispensary, the last month to be spent as senior assistant, if practicable.
- Two months in the kitchen, including service in the diet kitchen.
- Two months in the office.
- One month in the stables.
- One month on police duty.

At the completion of this service a man will have served in all departments of the hospital, and if he is of average intelligence, of good character, and interested in his work he should be a well-instructed Hospital Corps man.

The consensus of opinion is that it takes two years to make a good cavalry soldier and one year to make a good infantryman. To make a trained sanitary soldier from the average recruit without previous experience in any of his duties I think that the period of fourteen months herein recommended is not unnecessarily long. It should be remembered that from the time he enters the hospital the man performs the usual duties of the men of his corps. His services increase in value as the extent of his instruction increases.

Men with previous experience in cooking, pharmacy, nursing, clerical work, or in the line of the Army may of course be advanced more rapidly. This also may be done in the case of men of unusual aptitude and intelligence who are candidates for promotion, but who have had no previous experience.

Ordinarily I would not recommend a candidate for promotion to the grade of acting hospital steward until he had completed four months in the company or its equivalent and had served at least two months in the hospital. If he was in his first

enlistment and had had no previous experience in cooking, nursing, pharmacy, or clerical work I would not recommend his promotion until he had completed four months in the company and at least ten months in the hospital.

VI. CHARACTER AND EXTENT OF INSTRUCTION AFTER ASSIGNMENT TO POST HOSPITAL.

I would suggest that a plan of instruction be adopted at each post to extend over ten months of the year, the remaining two months being reserved for field service, practice marches, etc.

The instruction to be given for at least one hour daily (as required by existing regulations) in the following subjects:

1. Bearer drill, 40 hours (two months).
2. Fieldwork, including the use of the field equipment, 20 hours (one month).
3. Anatomy and physiology, 20 hours (one month).
4. First aid, 40 hours (two months).
5. Nursing, 40 hours (two months).
6. Elementary hygiene, 20 hours (one month).
7. Materia medica and pharmacy, 20 hours (one month).

As instruction in diet cooking, clerical work, and care of animals should be given while the men are on duty in the kitchen, the stables, and the office, these subjects are not considered in the schedule.

It would be well to have the "school year" end with the instruction in bearer drill and field work preparatory to the practice march with the troops of the post. Should the practice march be concluded within a month I would suggest that whenever practicable the hospital corps go into camp at the post, closing the post hospital and establishing a field hospital, where post sick are to be transferred and treated.

The number of subjects to be taught at one time will vary with the medical officer's experience. My experience has inclined me to think that the best results are obtained with two subjects taught on alternate days until they are concluded.

VII. CLASSES IN THE HOSPITAL CORPS.

To increase the efficiency of the Hospital Corps I have the honor to recommend the establishment of two grades among privates, with a separate rate of pay for each grade—first-class privates at \$20 per month and second-class privates at \$15 per month. The relative numbers of each class to be 3 of the first class to 2 of the second class. All privates to be enlisted in the second class and advancement to the first class to depend on special qualifications and fitness for the position, as in promotion to the grades of acting hospital steward and hospital steward, position in the first class to be dependent on continued good behavior and attentiveness to duty.

Privates of the first class to be qualified in one or more of the following lines of duty:

- Pharmacy.
- Nursing.
- Cooking.
- Clerical work (stenography).
- Carpentry.
- Blacksmithing.
- Ambulance driving, etc.

Recruits with training in any of these lines could be advanced on showing fitness after a few weeks' trial. Others to be promoted to the first class as they become qualified therefor and as vacancies occur.

The advantages of such a classification are as follows:

- (1) The increase in pay would more generally attract desirable men.
- (2) Men with special qualifications but who for various reasons are not fitted for the grade of acting hospital steward would still receive increased pay and other emoluments. In short, the grade of first-class private would be a recognition of special qualifications.

The duties of hospital corps men are now so specialized that it is impracticable to attempt to make the average recruit competent to fill every position in a large hospital. Therefore let a man qualify in one line of work for which he has aptitude and liking.

Men not qualified for the first class to remain in the second class on duty as police, orderlies, stablemen, etc. The pay of the second-class private at \$15 is more than that of a private of the line and would be ample compensation for the duties performed. At present the pay of all is alike, and the man capable only of manual work receives the same amount as a competent nurse, dispensary attendant, or stenographer.

(3) The cost of the Hospital Corps would not be increased by the change to two classes as herein proposed.

The pay of 100 privates at \$18 is.....	\$1,800
The pay of 60 first-class privates at \$20 would be.....	\$1,200
The pay of 40 second-class privates at \$15 would be.....	600
	1,800

VIII. COMPANY ORGANIZATION.

With a view to uniformity and as the most effective and satisfactory method of training hospital corps men, I would suggest that companies of instruction be attached to general or post hospitals having a capacity of 30 beds or more. All hospital corps men on duty at the post to belong to the company or companies, those on duty in the hospital to be considered as on "special duty." The number of men detached from the company for special duty in the hospital should not exceed one-third of the company. The maximum quota of a company having, say, 150 men, one company could ordinarily furnish for hospital duty the necessary detail for a hospital of 150 beds and have 100 men for company duty. At hospitals having a capacity of over 150 beds more than one company might be attached; for hospitals of, say, 160 to 300 beds, two companies; over 300 to 400 beds, three companies; over 400 to 600, four companies, etc.

Suppose, for example, there was attached to a 150-bed general hospital a company of instruction of 150 men. Fifty men would be on special duty in the hospital, one-third of whom (say, 17) constituting the permanent force and two-thirds (say, 33) making up the temporary force, or those under instruction. After a few months this hospital could turn out about 20 trained hospital corps men each month, including the necessary quota of noncommissioned officers—men who had had four months' instruction in the company and had passed through the different departments of the hospital—without in any way interfering with its most efficient and economical administration. Two or three such companies attached to large hospitals could supply the Army and could keep it supplied with uniformly trained hospital corps men, a result well worthy of consideration.

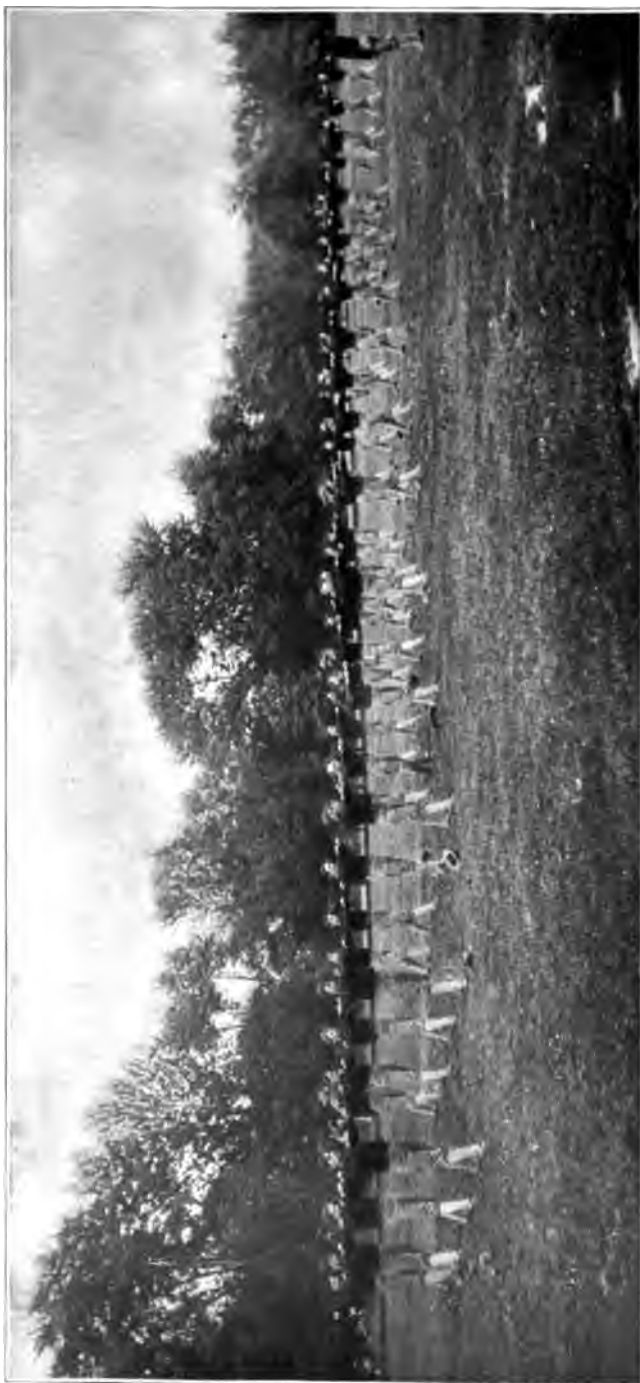
In time of war the uniform training of all recruits might be begun at once by organizing as many companies of instruction as were necessary and attaching them to base hospitals. Should the conditions necessitate the mobilization for field service with the least possible delay the recruits might be passed through the company, equipped, and sent to the field without hospital instruction. The length of the period of instruction in the company might also be reduced. Hospital training being least necessary in the personnel of ambulance companies and the regimental medical service, men without such training should preferably be supplied to these places and the men with hospital experience reserved for service at base or permanent hospitals and large field (division) hospitals.

LIST OF CALLS FOR COMPANY OF INSTRUCTION, HOSPITAL CORPS, JUNE 30, 1901.

	A. M.		P. M.
First call.....	5.30	School call.....	1.45
Assembly.....	5.50	Recall.....	2.45
Calisthenic drill.....	6.00	School call.....	2.50
Recall.....	6.30	Assembly.....	3.00
Breakfast.....	6.30	Recall.....	4.00
Police.....	7.00	Drill call.....	4.30
Company drill.....	7.45	Recall.....	5.30
Recall.....	8.15	Supper.....	6.00
Drill call.....	8.20	Sick call.....	5.45
Assembly.....	8.30	Retreat, first call.....	6.20
Recall.....	9.30	Assembly.....	6.30
School call.....	9.40		
Assembly.....	9.50		
Recall.....	10.50		
Dinner.....	11.45		

Saturday inspection.

First call.....	7.45 a. m.
Assembly.....	8.00 a. m.



CALISTHENIC EXERCISES, COMPANY OF INSTRUCTION, GENERAL HOSPITAL, WASHINGTON BARRACKS, D. C., 1901.



CALISTHENIC EXERCISES, COMPANY OF INSTRUCTION, GENERAL HOSPITAL, WASHINGTON BARRACKS, D. C., 1901.

11. **Appearing outside the squad rooms in shirt sleeves or blouses unbuttoned is strictly prohibited.**

12. **The following uniforms are authorized from this date until further orders:**

1. Blue cap, blue blouse, and blue trousers; black shoes.
2. Blue cap, blue blouse, and white trousers; tan shoes.
3. White cap, white blouse, and white trousers; tan shoes. Barracks shoes will not be worn outside the quarters. The campaign hat may be worn in wet weather.

All enlisted men of the command who leave the garrison or hospital grounds will confine themselves to these uniforms.

13. The uniform for drill, inspections, fatigue, and field exercises will be prescribed by the commanding officer of the company of instruction.

14. The brown canvas suit will be worn on fatigue only.

15. No one will be allowed to enter the kitchen or dining room between meal hours except on duty.

16. Beds must be neatly made up before reveille. No one, unless on sick report, will lie on his bed before dinner.

17. Every member of this company shall take a bath and change his linen at least once a week.

18. Ball playing is prohibited on the United States Army General Hospital grounds.

19. Owing to the malarial conditions prevailing at this post, it is forbidden to loiter on the banks or lie or walk on the grass near the river after retreat.

20. No intoxicating liquors will be brought into the company squad rooms.

21. Application for passes must be made at 6 p. m. on the day before they are to go into effect.

LEAVING THE GARRISON.

Except on Saturdays, Sundays, and holidays, no private on duty with the company of instruction will be permitted to leave the garrison between reveille and retreat roll calls without the permission of the company commander or written permission from the noncommissioned officer of the company. In every case where such permission has been granted the man will report his departure and return to the company office.

DISPOSING OF CLOTHING.

Attention is called to the provisions of the seventeenth article of war, which prescribes the penalties for selling or otherwise disposing of articles of equipment or uniform clothing.

Hereafter, immediately after the weekly inspection, each member of this company will display on his bed, neatly arranged, all the articles of clothing issued to him by the Government, for inspection and verification by the noncommissioned officer in charge of his squad.

Any man found to be lacking an article of clothing which has been supplied to him by the Government will be reported at once.

PASSES.

The following is published relative to the granting of passes:

Special passes will not be granted except in cases of urgent necessity.

All passes will be from 6 p. m. to 11 p. m., with the exception of ten men daily, who will be allowed to be absent until 6 a. m. The men composing the permanent force on duty with the company will be allowed passes until 12 p. m.

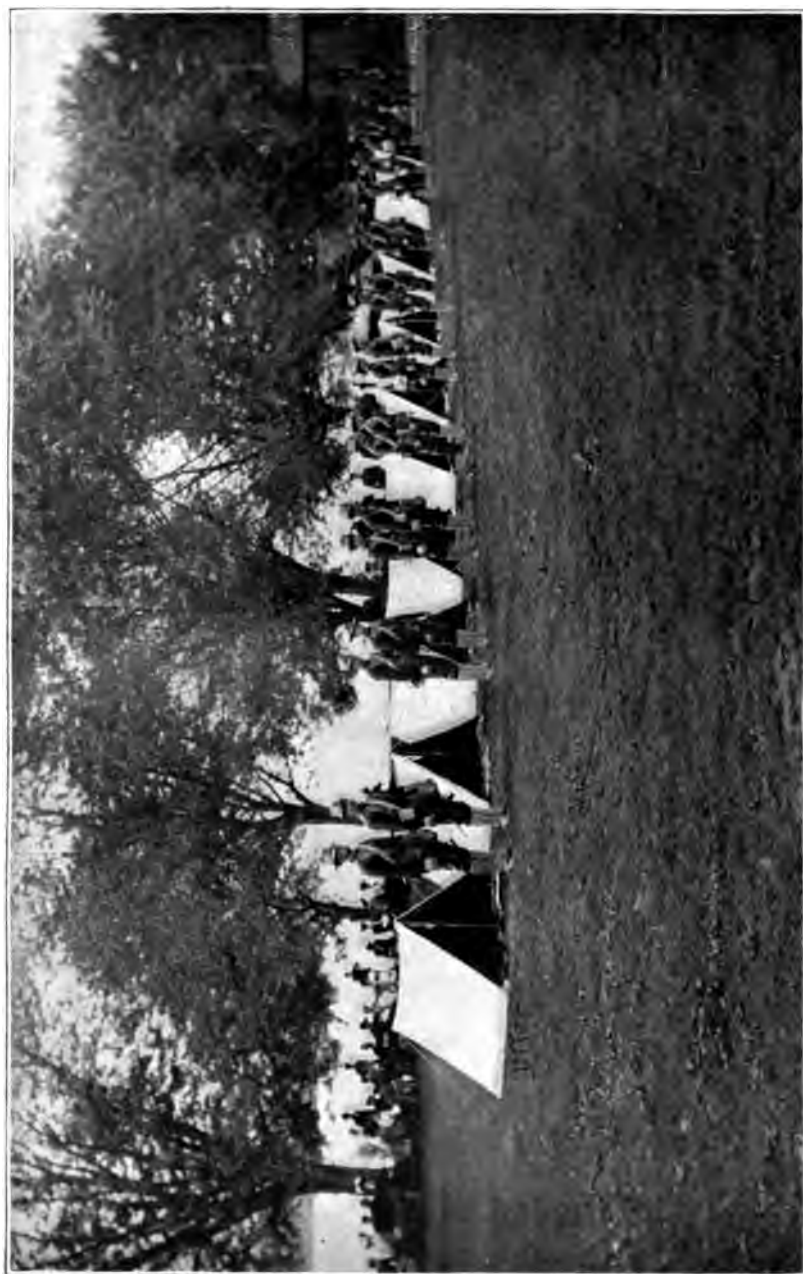
Uniform will be the dress for all. Special permission from the commanding officer must be obtained to wear civilian clothing while on pass.

All the men of this company are required to pay special attention to their personal appearance, their cleanliness and neatness, before leaving the post. Blouses and overcoats must be buttoned and kept so.

Passes for enlisted men of this command will be sent daily, at 6 p. m., to the gate guard, Washington Barracks, and will be sent for daily at guard mount. Enlisted men going on pass will report at the gate guardhouse their departure and return so that this date may be entered on the pass list.

Hereafter, and until further orders, the noncommissioned officer in charge of the gate guard at the time will require all members of the Hospital Corps coming in the gate between the hours of 11 p. m. and 6 a. m. to write their signatures on the pass list sent to the guard from this hospital.

In case of refusal the Hospital Corps man so refusing will be arrested and confined and report thereof made to the commanding officer, General Hospital, at 9 a. m. the following morning.



FIELD EXERCISES, COMPANY OF INSTRUCTION, GENERAL HOSPITAL, WASHINGTON BARRACKS, D. C., MAY 28, 1901.

DUTIES OF NONCOMMISSIONED OFFICER IN CHARGE OF BARRACKS.

The noncommissioned officer in charge of barracks will be detailed daily by roster from noncommissioned officers on duty with the company.

He will go on duty at 9.15 a. m. and will be relieved by his successor at the same time on the following day.

He will report to the commanding officer of the company when going on duty and when relieved.

While on duty he will sleep in the guard room and between the hours of 9 a. m. and 6 p. m. will be habitually in the guard room, except when attending to his duties as herein prescribed.

His duties are as follows:

To take roll calls from noncommissioned officers in charge of squad rooms at taps and reveille.

To receive reports from the watchman and from noncommissioned officers in charge of squad rooms.

In case of fire to give the alarm and proceed as ordered in the fire regulations.

He will make an inspection of all quarters at 11 p. m., noting all absentees of the company not on pass and see that all unauthorized lights are extinguished.

Members of the company returning between the hours of 9 p. m. and 6 a. m. will report to him.

The watchman will be under his immediate orders and he will be responsible for the efficient performance of the latter's duties.

DUTIES OF WATCHMAN.

He will report for duty to the noncommissioned officer in charge of barracks daily at 9 p. m., at 11 p. m., and on being relieved at 6 a. m., and at other times when necessary.

During his tour of duty he is subject to the orders of the commanding officer of the hospital, the commanding officer of the company, and the noncommissioned officer in charge of barracks.

He will patrol the grounds of the post at least every three hours.

He will constantly be on the alert for fires, lights, and unauthorized persons in the post, immediately reporting all unusual occurrences and violations of existing orders which come under his observation to the noncommissioned officer in charge of barracks.

REPORTS OF NONCOMMISSIONED OFFICERS.

Hereafter all noncommissioned officers will report for instructions at the company office at 8 a. m. They will report the status of the work and the immediate needs of the departments of which they are in charge, and instructors will also report the subjects of instruction in each class during the day. Suggestions relating to their departments and also to the welfare of the company are requested and should be made at this time.

The school at Fort McDowell, Angel Island, Cal., under command of Capt. William H. Wilson, assistant surgeon, United States Army, may be considered as a receiving and distributing depot rather than an educational institution. Through it for the most part the Division of the Philippines was supplied, each transport carrying besides the permanent detachment for duty aboard a greater or less number of men of the Hospital Corps for duty in Hawaii and Manila. Ninety-two men were sent from this station in August and 150 in September, 1900, part of whom went to China for duty with the relief expedition. This station was also used as a depot for men of the corps returned from the Philippines to the United States for various reasons, excepting those sent for treatment who went to the general hospital at the Presidio. The former were distributed to posts in the United States nearest their places of enlistment for duty, or for the restoration of their health after a tour of duty in the tropics, and were replaced by men recently enlisted

and awaiting transportation to the Philippine Islands. The methods obtaining at this school may be learned from the following report:

SCHOOL OF INSTRUCTION,
Fort McDowell, Cal., December 31, 1900.

SIR: I have the honor to submit the following report covering the year 1900 at this school.

During this time there have come and gone the following:

Enlisted men at school January 1, 1900	46
Female contract nurse (as dietist)	1
Gained by transfer	1, 105
Gained by enlistment	3

Total	1, 155
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Lost during the year:

By transfer to the Philippines	780
By transfer to Honolulu	6
By transfer to China	1
By transfer to hospitals in United States	240
By transfer to Signal Corps	1
Discharged	20
Deserted	9
By transfer to United States Army transports	28

Total	1, 085
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Enlisted men remaining at school December 31, 1900	69
Female contract nurse (as dietist)	1

Total	70
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The course of instruction was necessarily made short, owing to the great demand for men in our foreign possessions, and I arranged it to cover a period of four weeks and a daily instruction of six hours, so that those who properly applied themselves could not help gathering some knowledge of their duties.

The instruction consisted in first carefully giving them a knowledge of each of the regulations that affects them as soldiers of the Army and the importance of maintaining military discipline. This is taught by lectures, reading of Articles of War and Regulations frequently, and punishments of every infraction of discipline.

Lectures are given daily, both demonstrated and illustrated, on anatomy and physiology to a moderate degree, nursing, first aid, and minor surgery.

An hour each day is devoted to practical work, which includes bandaging, applying the first-aid packet to all parts of the body, taking and recording of temperatures, artificial respiration and resuscitation.

One hour a day is given to drill, litter-bearer drill, and the different methods of carrying a wounded man and applying temporary dressing on the field. Setting-up drill is given for half an hour each morning to straighten up the new recruits and limber up any stiff joints for the work of the day.

For the cooking, the classes are divided into four sections of about ten men each in order that each man may have practice in preparing each article of diet as he is directed to. This department is under the immediate superintendence of Miss Stoker, a contract nurse, and she performs her work with great satisfaction to all concerned.

Another feature of the instruction which was omitted from my last report is that given in office work and the preparation of the official papers. Many men have left this school able and efficient clerks who knew but little about these matters when they first entered the office.

It will be noted that during the year but two privates reached the grade of acting hospital steward while at this school, for the reason that only those were recommended to take the examination who were fully qualified, and these two, it can be said to their credit, passed a very creditable examination.

The grade of lance acting steward is given to men who have shown ability and aptitude to take charge of squad rooms or assist at drills or classes, and while acting as such they wear the chevron of a corporal, but this grade does not follow them after leaving this school.

Before closing this report, I wish to invite attention to the great assistance rendered me by Hospital Steward Michael Leahy. He is thorough, careful, and conscientious in the discharge of all his duties, and controls the men under him at this school, many of whom are recruits, in an excellent and soldierly manner.

Very respectfully,

WILLIAM H. WILSON,
Captain and Assistant Surgeon, U. S. A.,
Commanding School of Instruction.

Schedule of instruction, Fort McDowell.

Hours.	Monday.	Tuesday.	Wednesday.
A. M.			
7.10-7.40	Setting-up drill.....	Setting-up drill.....	Setting-up drill.
8-8.45	Study	Study	Study.
9-10	Section A. Cooking, litter drill.	Section D. Cooking, litter drill.	Cooking, review.
10.15-11.15	Lecture.....	Lecture.....	Lecture.
P. M.			
1.30-2.30	Section B. Cooking, bandaging, and practice work.	Section A. Cooking, bandaging, and practice work.	Fatigue.
2.20-3.30	Section C. Cooking, study.	Section B. Cooking, study.	Do.
Hours.	Thursday.	Friday.	Saturday.
A. M.			
7.10-7.40	Setting-up drill.....	Setting-up drill.....	
8-8.45	Study	Study	
9-10	Section C. Cooking, litter drill.	Section B. Cooking, litter drill.	Inspection.
10.15-11.15	Lecture.....	Lecture.....	Articles of war.
P. M.			
1.30-2.30	Section D. Cooking, bandaging, and practice work.	Section C. Cooking, bandaging, and practice work.	
2.30-3.30	Section A. Cooking, study.	Section D. Cooking, study.	

The company of instruction at Manila was principally used for the instruction of men newly arrived from the United States who were so hastily recruited that no opportunity for training or discipline had been afforded. It was also used as a depot of assembly and distribution, as will be learned from the following report by Capt. John S. Kulp, assistant surgeon, United States Army, dated June 18, 1900:

A Hospital Corps company of instruction had been needed in this division ever since the American occupation, but owing to the dearth of medical officers and Hospital Corps men, as well as to other obstacles, it was not practicable until January, 1900, to obtain a sufficient number for systematic instruction. With this object in view the following letter was written, under the caption "Proposed increase in capacity for sick:"

SUPPLEMENTARY WARDS,
Manila, January 1, 1900.

THE CHIEF SURGEON DEPARTMENT PACIFIC AND EIGHTH ARMY CORPS.

SIR: I have the honor to make the following recommendations in regard to the increase of the number of beds available for the sick, and the more systematic instruction of the men of the Hospital Corps:

The number of men casually at the First Reserve and other hospitals can be assembled in one place and regularly instructed in the various duties of the sanitary soldier, thus allowing the place which they now occupy to be given over to the sick, and also providing a number of well-instructed men for the various and constant demands made for them.

A suitable place is found in the abandoned magazine and its fortification adjoining this hospital. It could be made habitable by the following changes: (a) The removal of the present foot bridge, which is unsafe, and its change to a more suit-

able location; (b) the cutting of five windows in the magazine and the addition of a door, thus fitting it for officers' quarters; (c) the thorough cleaning of the whole inclosure.

For a company of instruction, varying between 40 and 100 men, the following administrative personnel would be required: One medical officer, 4 noncommissioned officers, and 1 private. For their subsistence at this hospital, an additional force of 4 privates.

JOHN S. KULP,
Captain, Assistant Surgeon, U. S. A.

[First indorsement.]

Respectfully forwarded to division headquarters, approved and recommended. If this plan be carried out, 75 beds in the First Reserve Hospital, that are now occupied by Hospital Corps men on duty there, together with the casualties belonging to the corps, who are constantly arriving from the United States, can be placed under conditions where they can be disciplined, properly handled, and instructed in their duties. The expense appears to be trifling, and the personnel can be taken principally from men now at the hospital.

CHARLES R. GREENLEAF,
Colonel, Assistant Surgeon-General, U. S. A., Chief Surgeon.

[Fourth indorsement.]

Respectfully forwarded to the adjutant-general of the division, recommending approval, the allotment, etc.

C. P. MILLER,
Major and Quartermaster, U. S. A., Chief Quartermaster.

[Fifth indorsement.]

Respectfully returned to the Chief Quartermaster, approved as indicated in the fourth indorsement.

By command of Major-General Otis:

THOS. H. BARRY,
Assistant Adjutant-General.

This request being granted, 14 men were transferred by the middle of January, and although they were not the most efficient and soldierly men of the corps, they formed a nucleus, and others of a better class were obtained by transfer from the line and also from various detachments. At first the discouragements were many, and the final success of the organization is principally due to the constant supervision and assistance rendered by the chief surgeon.

Location.—The place selected is the Redan San Carlos, a part of original fortifications, which date back to 1591. They were remodeled in 1604, 1691, and again in 1762, and are in an admirable state of preservation. It is very questionable whether artillery was ever mounted in this particular fortification, although it is practically impregnable to unsupported infantry. The foliage-covered walls inclosed a space filled with rank vegetation and small trees, the center of which was the massive stone magazine. With the exception of the gun emplacements, which are of Chinese granite, the masonry is of the same Roman cement blocks as is used on the walls of the city. The labor of cleaning out was interrupted by the finding of three pythons, the largest of which was over 11 feet in length. These, together with monkeys, wild bees, centipedes, lizards, and enormous spiders, have been the only inhabitants for many years.

The guard and lecture tents are on the walls, which range from 18 to 45 feet in thickness, while 18 hospital tents in the gun emplacements furnish quarters. Each is framed and floored over the granite, and a 6-inch terra-cotta pipe running through the wall affords excellent drainage for each. At high tide the moat surrounding the redan is filled with 6 feet of water, beneath which is mud of unexplorable depth. The moat is kept free of vegetation in order not to obstruct the flow of water, and the camp has been remarkably healthy.

Sea bathing is convenient, but most of the men prefer the baths of hospital No. 3, which are easily accessible.

In order to place the company upon a sounder official footing, the following order was issued on the recommendation of the company commander:

[General Orders, No. 23.]

MANILA, P. I., May 23, 1901.

In view of the necessity for properly instructing small detachments of the Hospital Corps, and because of the number of untrained men constantly reporting for duty, a Hospital Corps company of instruction is hereby established, to be located in the city of Manila.

1. The personnel of said company will consist of 2 medical officers, 1 hospital steward, 3 acting hospital stewards, 2 Hospital Corps privates, in addition to 60 men under instruction.

2. The curriculum will consist of such practical and theoretical instruction as may be necessary to insure proficiency in all the duties of the sanitary soldier, and will extend over a period of fourteen weeks. The faculty of the school will consist of its commanding officer and such other instructors as the chief surgeon may designate from among the medical officers serving in Manila.

3. At the completion of the course those passing satisfactory examinations will receive the certificate of the school; those passing special qualifications will be recommended for promotion to the grade of acting hospital steward.

4. The discipline and internal administration of the school will conform to that of a company of infantry.

5. The chief surgeon of the division is authorized to take such measures as will result in the transfer of men to and from the company, as may be indicated by the needs of the service.

By command of Major-General MacArthur:

M. BARBER,
Assistant Adjutant-General.

The periods of instruction are as follows:

Hour.	Monday.	Tuesday.	Wednesday.
A. M.			
7.15-8.15	Drill.....	Drill.....	Drill.
9.40-11	Study hour.....	Study hour.....	Study hour or signal drill.
11-12	Pharmacy.....	Minor surgery....	First aid.
P. M.			
3-4	First aid.....	Elementary anatomy and physiology.	Do.
4-5.25	Study hour.....	Study hour.....	Study hour.
Hour.	Thursday.	Friday.	Saturday.
A. M.			
7.15-8.15	Drill.....	Drill.	Inspection (10 a. m.). Drill.
9.40-11	Study hour.....	Study hour.....	
11-12	Regulations and discipline.	Nursing	
P. M.			
3-4	Clerical work	First aid.	
4-5.25	Signal drill.....	Study hour.	

While receiving practical instruction in wards men will attend all lectures; while receiving practical instruction in cooking men will attend afternoon lectures; while receiving practical instruction in diet cooking men will attend all lectures.

The course covers between sixteen and eighteen weeks and consists of 105 periods of theoretical and one hundred and twenty hours of practical instruction. In addition, each man is detailed for seven days in a hospital ward under the instruction of its surgeon. During this time he is taught the practical routine work of the ward, the actual contact with patients, methods of treatment, and administration of medicines, all of which are considered indispensable.

Cooking can not be taught theoretically with success, even from such excellent aids as the Manual for Army Cooks and Munson's Emergency Diet for the Sick. Every man is put in the main kitchen of Hospital No. 3 and is taught the actual cooking by the second cook there. No more than two men are under instruction at any one time and the minimum period is five days. Those showing real aptitude are then given additional instruction in this branch. After serving in the main kitchen the recruit receives three days of training in that for light diet. Here, where over 300 meals are prepared daily, he acts as assistant to the second cook and is taught the tasteful serving and the preparation of a few standard delicacies rather than an imperfect smattering of the whole subject. But one man is under instruction at a time in this place.

Of the practical instruction the cultivation of upright and soldierly habits and the inculcation of thorough discipline are considered of great importance because of the peculiarly grave duties of the Hospital Corps private, especially in detached commands, where the trustworthiness of the sanitary soldier becomes a matter of life or death. The daily drill in marching, the manual of the loaded litter and travois, is made sharp and progressive. Fieldwork in handling patients, applying dressings, and surmounting obstacles is taught on three afternoons a week throughout the whole course, while each member of the class is given enough of signal drill to enable him to use this system of communication in emergencies.

A synopsis of the theoretical instruction is as follows, each course consisting of lectures, demonstrations, and recitations:

PHARMACY (MONDAY, 11-12 A. M.; LIEUTENANT MILLHOFF, INSTRUCTOR).

Lecture 1.—The weights and measures: their origin and bases, relation to each other, with especial regard to the metric system.

Lecture 2.—The abbreviations and terms of pharmacy.

Lecture 3.—Simple definitions of the preparations. The tincture, fluid extract, extract, pill, ointment, etc.

Lecture 4.—The operations of pharmacy, filtering, etc.

Lecture 5.—Practical points on dispensary work, cleanliness, systematic arrangements, care of scales, etc., dispensing, with especial reference to poisons.

Lecture 6.—The ingredients and doses of some of the simpler remedies such as seidlitz and Dover's powders, compound cathartic pills, etc.

Lecture 7.—The alkaloids in general, their sources, formation, and doses of their salts.

Lecture 8.—The alkaloids in most common use, morphine, quinine, etc.

Lecture 9.—Opium, source, doses, and strength of preparations.

Lecture 10.—Mercurial preparations, arsenic, and iron.

Lecture 11.—The general classification of drugs according to their physiological action, stimulants, depressants, etc.

Lecture 12.—The various antidotes to poisons.

Lecture 13.—General instruction on the subject-matter of the first seven lectures.

Lecture 14.—The same on the remaining lectures. Questions by the class.

Lecture 15.—General review, prescription reading.

MINOR SURGERY (TUESDAYS, 11-12 A. M.; ACTING ASSISTANT SURGEON A. W. WILLIAMS, INSTRUCTOR).

Lecture 1.—Informal talk on surgical procedures in general, cleanliness, preparation of the operating room, hands, instruments, dressings, etc.

Lecture 2.—The preparation of the patient for an operation where a general anæsthetic is required. Field of operation.

Lecture 3.—Anæsthetics, general and local. Their indications.

Lecture 4.—Administration of a general anæsthetic. Contra-indications.

Lecture 5.—Care of patients after operation.

Lecture 6.—Wounds, their varieties, causes, and treatment.

Lecture 7.—The healing of wounds.

Lecture 8.—Hemorrhage, varieties, causes, and treatment.

Lecture 9.—Ulcers and abscesses, causes, varieties, and treatment.

Lecture 10.—Sprains and bruises.

Lecture 11.—Dislocations, with special reference to diagnosis.

Lecture 12.—Fractures in general, special fractures, splinting.

Lecture 13.—Minor amputations, gangrene.

Lecture 14.—The anatomy, care, diseases, and extraction of teeth.

Lecture 15.—General review.

ELEMENTARY ANATOMY AND PHYSIOLOGY (TUESDAYS, 3-4, P. M.; MAJOR KULP).

Lecture 1.—(Text-book, Pilcher.) The human machine; what is meant by energy, life, and the lower forms of life.

Lecture 2.—The cell, varieties, life history, specialization.

Lecture 3.—The skin and its functions.

Lecture 4.—The fat and its uses.

Lecture 5.—Review.

Lecture 6.—The bones and the joints.

Lecture 7.—The nervous system.

Lecture 8.—The blood and its circulation.

- Lecture 9.*—The arteries.
- Lecture 10.*—Review.
- Lecture 11.*—The apparatus and mechanics of respiration.
- Lecture 12.*—Digestion.
- Lecture 13.*—The viscera.
- Lecture 14.*—The special senses.
- Lecture 15.*—Review.
- Lecture 16.*—Physiology as a whole.
- Lecture 17.*—Microorganisms.
- Lecture 18.*—Infection and its prevention.
- Lecture 19.*—General field hygiene.
- Lecture 20.*—Review.

FIRST AID (WEDNESDAYS, 11-12 A. M.; ACTING ASSISTANT SURGEON VAN METER, INSTRUCTOR).

- Lecture 1.*—Outline of the subject and scope of its operation.
- Lecture 2.*—Gross topography of the body; explanation of the more simple technical expressions.
- Lecture 3.*—The vulnerable parts of the body.
- Lecture 4.*—Bandages and dressings, with special reference to fractures.
- Lecture 5.*—Classification of various first-aid dressings and their applications.
- Lecture 6.*—The wounds and injuries of the battlefield.
- Lecture 7.*—The application of first-aid dressing to wounds.
- Lecture 8.*—Hemorrhage in detail.
- Lecture 9.*—Specific hemorrhage, in regard to treatment.
- Lecture 10.*—The emergency treatment of unconsciousness in general.
- Lecture 11.*—Asphyxia, suffocation, poisons.
- Lecture 12.*—Emergencies in general.
- Lecture 13.*—General review of first half of course.
- Lecture 14.*—General review of remainder of course.
- Lecture 15.*—Quiz and questions by the class.

REGULATIONS, ALLOWANCES, AND DISCIPLINE (THURSDAYS, 11-12 A. M.; HOSPITAL STEWARD HARTFORD, INSTRUCTOR).

- Lecture 1.*—The Army Regulations and Articles of War, with special reference to those affecting the Hospital Corps soldier in his relations to other branches of the service.
- Lecture 2.*—Continuation of the same subject.
- Lecture 3.*—The duties of an orderly in detail. How to transmit and receive messages; how to address superiors; the various ranks and their insignia.
- Lecture 4.*—Changing station. The proper course for an order. The ration, transportation, arrival, and reporting.
- Lecture 5.*—Records, and why they are necessary. A general discussion of how to take charge of the papers of a detached command.
- Lecture 6.*—Morning report of Hospital Corps detachment. Report of sick and wounded, and special reports to brigade and division headquarters.
- Lecture 7.*—Inventory and classification of property.
- Lecture 8.*—Want list. List of condemned property. Requisitions, annual, special, emergency, etc. Invoices and receipts. Clearances.
- Lecture 9.*—Management of the various kinds of property. Memorandum receipts.
- Lecture 10.*—The ration return, and the accumulation and use of the savings thereof. Fuel, forage, and illuminating supplies.
- Lecture 11.*—Official letter writing, briefing, and indorsing.
- Lecture 12.*—Descriptive lists, clothing accounts, and schedules.
- Lecture 13.*—Discharge and final statements.
- Lecture 14.*—The routine monthly reports.
- Lecture 15.*—General monthly review.

CLERICAL WORK (THURSDAYS, 3-4 P. M.; HOSPITAL STEWARD ARMSTRONG, INSTRUCTOR).

- Lecture 1.*—Necessity and advantage of neatness and accuracy.
- Lecture 2.*—The ration return. Commutation and savings of ration.
- Lecture 3.*—Clothing, how obtained, stored, issued, and accounted for.
- Lecture 4.*—The property responsibility of enlisted men, with special reference to the Hospital Corps.

Lecture 5.—Medical property, how obtained, to whom issued, how and to whom accounted for. Lost property.

Lecture 6.—Quartermaster property in the same detail.

Lecture 7.—Ordnance property in the same detail.

Lecture 8.—Register of patients and report of sick and wounded.

Lecture 9.—Briefing and indorsing official correspondence.

Lecture 10.—Mustering and pay rolls, descriptive lists, Hospital Corps returns, and recruiting papers.

Lecture 11.—Proceedings of boards of survey and courts-martial.

Lecture 12.—Discharge for disability. The preparation of discharge certificates and final statements.

Lectures 13, 14, 15.—A quiz by the instructor in relation to the subject-matter of the preceding lectures, and responses to questions by the class.

NURSING, HYGIENE, AND WARD MANAGEMENT (FRIDAYS, 11-12 A. M.; ACTING ASSISTANT SURGEON W. J. LYSTER, INSTRUCTOR).

Lecture 1.—(Text-book, Weeks.) The ward duties of a nurse. Cleanliness, order, economy, system, noise, etc.

Lecture 2.—Beds, common, field, air, and water. Bedding and its care. Bed sores.

Lecture 3.—The pulse, temperature, respiration, ventilation.

Lecture 4.—Symptoms, attitude, expression, subjective and objective. The faculty of observation.

Lecture 5.—Medicines, their administration; prescription reading; names of common drugs.

Lecture 6.—How medicines act. Dosage.

Lecture 7.—Poisons.

Lecture 8.—External medication, counterirritants, rubefacients, vesicants, cupping, leeches, poultices, etc.

Lecture 9.—Enemata, injections, purgatives, baths, and massage.

Lecture 10.—Parasites, internal and external.

Lecture 11.—Infectious diseases and their prevention.

Lecture 12.—Surgical nursing, operations, hemorrhage.

Lecture 13.—Emergencies.

Lecture 14.—Hygiene in general.

Lecture 15.—The hygiene of the ward.

Lecture 16.—The management and discipline of the ward.

Lecture 17.—The records of a ward.

Lecture 18.—General review.

The examinations are both written and oral, and the certificate of the school is given only to those who are fitted for the special work of the Hospital Corps private. The final mark is based on (a) character and habits; (b) practical proficiency as reported by the first sergeant, ward masters, and cooks; (c) the written examination in each theoretical subject; and (d) the result of drill, field work, signal proficiency, and recitations. Of the last class of 43 there were 13 graduates.

The discipline and administration conforms to that of a company of infantry. The permanent personnel consists of a commanding officer, first sergeant, drill sergeant, quartermaster-sergeant, clerk, and bugler. The two latter are privates of the Hospital Corps, the acting sergeants being noncommissioned officers of the same.

The graduating exercises of the first class were held on the 15th of June, in the presence of the major-general commanding and the chief surgeon of the division. The following programme was carried out:

Selection, by Sixth Artillery Band.

Practical exercises with roller and triangular bandages.

Address to the graduates: Col. Charles R. Greenleaf, chief surgeon of the division, assistant surgeon-general United States Army.

Demonstrations by members of the class:

(a) The blanket litter.

(b) Humane restraint.

(c) Artificial respiration; placing the patient in bed.

(d) Lifting and carrying patients.

Awarding certificates, prizes, and chevrons: Maj. Gen. Arthur MacArthur, military governor of the Philippines.

Selection, by Sixth Artillery Band.

Exhibition drill.

It is believed that this company fulfills a useful purpose. That an esprit de corps of no mean grade already exists among its men was shown by an instant and unani-

mous answer to a call for volunteers to nurse plague patients, and the fact that one of the class (Private Archibald D. Wilson) remained on duty for hours with a delirious case of septicæmia after receiving what he supposed to be a fatal wound, and which indeed proved to be a badly infected one.

The first class was handicapped by an unavoidable delay in receiving its instruction books, and by an amount of fatigue work that somewhat justified the remark that the principal studies were digging ditches and carrying lumber; yet the progress of the class was fairly satisfactory. The next enters under much more favorable auspices.

Casual camp.—The casual camp is organized as a subpost to the company of instruction and is situated near it on the field of Bagumbayan.

Almost every transport bearing American troops to the Philippines brought enlisted men of the Hospital Corps as well, but until January, 1900, they were assigned to the detachment of the First Reserve Hospital and withdrawn as occasion required. Coincidentally with the establishment of the company of instruction, the camp was organized, and since that time its personnel has fluctuated between 10 and 220. The present number is 74.

The camp receives all recruits, men awaiting assignments, as well as those casually in Manila, and consists of a variable number of hospital tents floored and furnished with cots. The men mess at Hospital No. 3. Water for ordinary purposes is furnished by a hose line from the city mains and drinking water from the sterilizing plant at the hospital. The dry-earth system of pan closets is used.

When the recruit arrives he spells his name to the noncommissioned officer, who checks it and takes an inventory of his Government property, the result of which he records on the card index, affixing his initials. The recruits are then assigned to tents and given copies of the orders for camp.

All require light summer clothing, and this is issued as soon as is practicable. When it is realized that the monthly return of the Hospital Corps personnel usually contains four or five hundred names, the amount of clothing issued may be understood.

A record is taken of any special qualifications the recruit possesses, and his non-commissioned officers are interrogated concerning his efficiency, character, and habits. His name is now placed on the assignment list, and he is recommended for whatever vacancy he appears best qualified to fill. Those men not showing unmistakable evidence of recent and successful vaccination are revaccinated. In practice this amounts to nearly the whole number, and the success obtained proves the wisdom of the operation. It is believed that the notation, "successful," on the descriptive list applies equally well to vaccinia and streptococci infection.

The sick report of the camp is large, the principal causes of admission being venereal and tropical skin diseases, together with intestinal disturbances connected with excesses in a new climate. These recruits proved no exception to the general rules governing their class.

The records required of the camp are a morning report to the commanding officer, sick report, duty roster, card index of enlisted men, and record of special qualifications.

While awaiting assignment the men receive regular instruction in connection with the company, consisting of the daily morning drill and practical work of various kinds. Their stay in camp being of such uncertain length, renders it difficult to attempt really systematic instruction.

When the recruit is assigned to duty, the noncommissioned officer in charge of transportation procures it by boat, rail, or cart; the man is furnished with subsistence and given written directions regarding the place where he is to report. Just before leaving his property is again checked by the acting quartermaster-sergeant, and upon the result, noted on his card index slip, is based the invoice for the property as transferred to his new commanding officer. The descriptive list is invariably mailed within twenty-four hours. Up to this date 774 noncommissioned officers and privates have passed through the camp, and there has been no loss of man or property.

The success which followed the instruction given at these schools has been shown in the special reports, not alone of medical officers, but of many other officers.

Regimental field hospital.—About the last of February, 1901, I notified the Quartermaster-General of my purpose to assemble at certain posts so much of the material of a regimental field hospital (General Orders No. 178, November 8, 1898, from the Headquarters of the Army) as is furnished by the Medical Department, and suggested, in order that these hospitals may be thoroughly efficient and ready for

immediate service, that the Quartermaster-General assemble the necessary camp equipage and transportation, if not already at the posts. The following posts were finally designated, viz:

Department of the East: Fort Columbus, New York Harbor; Plattsburg Barracks, N. Y.; Fort McPherson, Ga.

Department of the Lakes: Fort Sheridan, Ill.; Fort Thomas, Ky.

Department of Dakota: Fort Snelling, Minn.; Fort Meade, S. Dak.

Department of the Missouri: Fort Leavenworth, Kans.; Jefferson Barracks, Mo.

Department of Texas: Fort Sam Houston, Tex.; Fort Clark, Tex.

Department of the Colorado: Fort Logan, Colo.; Fort Douglas, Utah.

Department of the Columbia: Vancouver Barracks, Vancouver, Wash.

The object in the organization of two regimental field hospitals in each department is to have at hand for immediate use by the local military authorities a complete equipment sufficient for the medical needs of a considerable percentage of the command in emergency for active service, field maneuvers, instruction, etc. It is expected that these hospitals will be maintained in the best possible condition and always be in readiness for transfer to any point within the department.

A considerable number of reports have been received in response to a circular letter to chief surgeons, requesting them to ascertain the views of medical officers who may have had active service as to the transportation of the wounded, particularly in regard to details from the line of the Army for this purpose, and to their instruction under paragraph 1608, Army Regulations, 1901. The consensus of opinion seems to be: First, that details of litter bearers from the line have very generally been made; second, that such details were made by the company commander from any men conveniently at hand at the time of the emergency; third, that the work was fairly well done; fourth, that the detail of permanent company bearers is not deemed desirable, but that all men of the line should be so instructed as to be available for bearer work whenever required.

As to the instruction in first aid heretofore given by the company officers under the requirements of this paragraph (1608), it is regarded as being ineffective, and it is suggested that more attention be paid to that part of the regulations which requires the company officers to be thoroughly instructed.

The Hospital Corps is, in the very nature of its work, represented in every engagement; indeed, wherever there may be other soldiers, there, too, are men of this organization. I take pride in the fact that these men have borne themselves creditably under all conditions of service. The following have been especially commended since the date of the last report:¹

Hospital Steward William A. McGuire.

Hospital Steward E. C. Baldwin.

Hospital Steward Michael Leahy.

Hospital Steward Herbert L. Kneisley, Forty-seventh Infantry, United States Volunteers.

Acting Hospital Steward John R. Kissinger.

Acting Hospital Steward Charles K. Metcalf.

Private Edgar Moore.

Private Ernest H. Stuckert.

Private F. E. White.

Private E. T. Hitch.

Private Louis Palsen.

¹ It is possible that not all are mentioned in this list who are entitled to be, as copies of reports of this character are not invariably furnished this office.

choice of articles of tested fitness. The only practical test in many cases must be actual service in ward or field. To require purchases from the lowest bidder under competition would, even when every reasonable care is taken, often result in the purchase of articles which, when exposed to the test of actual service, would prove to be unsatisfactory. Certain kinds of service also can be engaged to better advantage without advertising than under the formalities of competition. There is, for example, a great amount of hospital linen to be laundered in the course of a year, varying from time to time with the exigencies of the service. If the amount to be done could be fairly approximated, and were all to be done at one post or hospital, or even a few, the soliciting of bids and letting of contracts thereunder would be a simple matter. But the work must be done at a great number of places, often changing with the movements of the Army, and at frequent intervals. When done by individual laundrers, as at detached posts, the work is now regarded as "personal service" under section 3709, Revised Statutes, for which no advertising is required. If done, however, by steam laundries, it is doubtful whether the exception would hold good, but it would entail great labor and delay to obtain bids and let the contracts for the large number of separate commands, hospitals, and transports. The repair of surgical instruments and hospital equipment, which frequently can only be done in a satisfactory manner by the firms and corporations engaged in their manufacture, can also be engaged more expeditiously and to better advantage by direct application to such firms and corporations than by soliciting bids. No substantial economy can be effected by the effort to obtain competition in such cases which will offset the enormous amount of paper work and administrative circumlocution incident thereto. I therefore earnestly recommend that the Medical Department be again enabled, as under the law prior to March 2, 1901, to go into open market at its discretion, and to that end urge the enactment of the proviso proposed above. This proviso, while it differs in words from the law of 1893, is designed to have the same effect. The new phraseology is, however, preferred as better adapted to accomplish that result, having in view the numerous provisions of law modifying section 3709, Revised Statutes, which have from time to time been enacted. Under the proposed law the Medical Department will, of course, be free to advertise for competition when that course is thought to be in the public interest.

MEDICAL INSPECTIONS.

I would again respectfully renew my recommendation that the regulation, which has for several years practically interdicted systematic inspection by chief surgeons, and which regulation is continued in force in paragraph 1671, Army Regulations, 1901, be modified to read "Chief surgeons will visit each post in their departments at least once a year," etc. No argument in support of this would seem to be necessary. The work of the Medical Department is primarily with men and secondarily with materials. The men are the invalids, who represent a considerable percentage of the line of the Army, whose condition and wants can be intelligently appreciated only by an educated physician, and the personnel, the sanitary soldier, who cares for them. In other services the necessity for such inspection is admitted, and met by a corps of medical inspectors. Indeed, this was the case in

our service during the war of 1861-1865. But since the promulgation of this regulation, which includes the period during and since the Spanish-American war, such medical inspections have been made irrespective instead of because of regulations.

EXHIBIT OF THE MEDICAL DEPARTMENT AT THE PAN-AMERICAN EXPOSITION, BUFFALO, N. Y.

In response to the request of the authorities of the Pan-American Exposition, Buffalo, N. Y., I recommended to the Secretary of War that the Medical Department place on exhibition at the exposition a fully equipped field hospital, having attached thereto a Hospital Corps personnel of sufficient size to furnish attendants and guards for the exhibit and to give exhibition drills in first-aid work and transportation of the wounded, believing that this exposition afforded an excellent opportunity for acquainting the general public with the equipment of the Medical Department, its methods and resources, and with the efficiency of the Hospital Corps. It was also requested by the exposition authorities that this Department make an indoor display in the Government building of material drawn from the Army Medical Museum and the library of the Surgeon-General's Office, but as the floor space available for this purpose amounted to but 400 square feet I was unwilling to recommend such an exhibit, since the latter, from the insufficient space, could not be made of a size and scope commensurate with the dignity and resources of this Department.

The exhibit, which was in charge of Capt. E. L. Munson, assistant surgeon, United States Army, consisted of a brigade field hospital of 100 beds, and was excellently located on a plot of ground immediately south of the Government building, very accessible to visitors and of sufficient size not only to contain the hospital tentage without crowding but also furnish an adjoining space suitable for drill purposes. The hospital was fully equipped in all its details according to the provisions of the latest supply table, the purpose being to leave nothing to the imagination of visitors, the majority of whom would be unfamiliar with military matters, but to demonstrate the equipment of the Medical Department in respect to the brigade-hospital unit in quantity, size, and capacity, as well as in form, variety, and quality. The exhibit was peculiarly unique and attractive, as the equipment displayed was almost wholly composed of articles lately incorporated in the supply table of this Department as a result of the recommendations of a board of medical officers who were engaged for nearly two years in the improvement of the hospital equipment and supplies. These articles had never previously been brought together for consideration as a unit in the field hospital, and their comprehensiveness, compactness, portability, and practical efficiency for the purpose indicated, as demonstrated in the exhibit made at the Pan-American Exposition, give occasion for much congratulation. Probably no such modern and complete equipment for the care of the sick and wounded in the field could be shown at the present time by any other army in the world. The exhibit has been inspected by a large number of officers of foreign services, who have personally and in their official reports given it the highest praise.

The hospital wards of the exhibit were arranged in the form of a cross, one arm of which ended directly at the steps of the arcade between the Fisheries and the main Government building, so as to serve as the main entrance and afford a very attractive view of the interior of the hospital to passing visitors. From the shape of the ground it was found possible to pitch but 12 ward tents, having a capacity



PARTIAL FRONT VIEW OF UNITED STATES ARMY BRIGADE FIELD HOSPITAL, PAN-AMERICAN EXPOSITION, BUFFALO, N. Y.

of 72 beds. The covered space at the intersection of the wards contained a large collection of radiographs and photographs illustrating the actual work of the Medical Department in the field. Between the arms of the cross were located the dispensary, office, surgical, mess, store, and kitchen tents, the line of tents of the Hospital Corps detachment being placed on the right flank of the hospital, with a graveled parade ground intervening.

The plot occupied by the hospital was sodded, except where graveled walks were necessary for communication, and the attractiveness of the exhibit as a whole was such as to elicit much commendation from visitors.

The morning and afternoon drills of the Hospital Corps detachment, the latter consisting of 3 noncommissioned officers and 20 privates, have proved an extremely interesting and instructive feature of the exhibit, attracting large crowds of visitors and exciting much favorable comment. The conduct of these men has been excellent, and their soldierly appearance and technical ability reflect much credit on the corps they have so well represented.

The number of visitors who have inspected the field hospital and witnessed the exhibition drills of the Hospital Corps is very great and my expectation that this exhibit would prove an attractive and interesting as well as instructive feature of the exposition has been amply justified. The character of the exhibit is such as would naturally attract military and medical men, and in addition the recent war with Spain and hostilities in the Philippines and in China have aroused a general interest in military matters. A large proportion of visitors at the exposition have had relatives or friends in the regular or volunteer forces, and these, particularly the women visitors, have shown much interest in the methods and appliances by which sick and wounded soldiers are cared for by this Department in the field. As a means of educating the popular mind with respect to the efficiency of the Medical Department this exhibit has thus been of very great value. Records of the attendance at the exhibit are being preserved and these show that the number of visitors inspecting the field hospital and attending the drills of the Hospital Corps detachment up to August 1 was probably equal to about 20 per cent of the total paid admissions to the exposition. During the first three months after the opening of the latter it is probable that about 500,000 persons inspected the equipment of the hospital and witnessed the exhibition drills, and with the increased attendance during the latter months of the exposition it is probable that nearly 1,500,000 persons will, by this means, have been educated to a better knowledge of the resources and workings of the Medical Department.

Since the foregoing paragraphs were written the preliminary statement of awards has been received, and is as follows:

The Medical Department of the Army has established immediately south of the Government building a model brigade field hospital. Seldom has the public been able to inspect such an exhibit. It is especially interesting since it represents the new equipment of the Medical Department in the field—scarcely an important article of which but has been adopted since the outbreak of the war with Spain and has never been shown previously.

The detail of enlisted Hospital Corps men give daily an exhibition drill in first aid to the wounded, litter drill, demonstrations of the various means of transporting the wounded, tent pitching, and hospital establishment. The drills are very popular, and in connection with them the hospital forms a most complete and creditable exhibit of the medical service of the Army.

We recommend the following for recognition: * * * Medical Department, United States Army, model brigade field-hospital drills.

RECRUITING.

The total number of men examined for enlistment in the Regular Army during the year 1900 was 39,916, of whom 38,115 were white and 1,801 were colored. The number accepted was 22,479, or 563.16 out of every thousand examined. The ratio of accepted men was 558.68 for the white and 657.97 for the colored. White men to the number of 75.77 and colored men to that of 43.86 per thousand declined enlistment. The rate of rejection on primary examination was 365.55 among the white and 298.17 among the colored candidates, giving a mean of 362.51. These statistics do not include among the rejections the cases of applicants who were so obviously unfit for the military service that they were rejected by the recruiting officer without being subjected to a medical examination.

The ratio of accepted men during the past year was considerably smaller than during the years immediately preceding. In 1897, a year of peace, the ratio was 702.19 out of every thousand examined. In 1898 during the active recruiting to increase the numerical strength of the Army the accepted men numbered 770.47 per thousand examined, but in 1899 the ratio decreased to 681.24 and during the past year to 563.16, showing evidently that greater care is exercised in the selection of men for the service.

Of every thousand of the accepted men 854.18 were natives of the United States, 39.01 were born in Germany, 33.94 in Ireland, 14.32 in England, 13.43 in Canada, 7.70 in Sweden, 5.69 in Austria, 4.94 in Russia, the remainder in various other countries. The war period, 1898-99, lessened very materially the ratio of foreign-born men enlisted for service. In 1897 the foreign born constituted 257.53 per thousand of the accepted recruits. In 1898 this ratio was reduced to 153.98, in 1899 to 144.39, and last year to 145.82.

Of every thousand men examined during the past year 89.42 were rejected on account of imperfect physique, including overheight, underheight, overweight, and underweight, 56.04 for diseases of the eye, 48.90 for diseases of the circulatory system, 34.02 for diseases of the genito-urinary system, 30.56 for diseases of the digestive system, 24.28 for venereal diseases, 13.48 for hernia, while 11.65 were rejected as generally unfit or undesirable, 8.40 for diseases of the integument and subcutaneous connective tissues, 5.16 on account of bad or doubtful character, 4.38 as unclassified, 4.36 as minors, 4.13 for diseases of the muscles, bones, and joints, while only 2.73 were rejected on account of illiteracy, imperfect knowledge of the English language, or mental insufficiency.

Number of white and colored applicants for enlistment examined physically during the year 1900, with the number accepted, rejected on primary examination, and declined, with ratios per thousand.

	White.		Colored.		Total.	
	Number.	Ratio per 1,000 examined.	Number.	Ratio per 1,000 examined.	Number.	Ratio per 1,000 examined.
Examined	38,115	1,000	1,801	1,000	39,916	1,000
Accepted	21,294	558.68	1,185	657.97	22,479	563.16
Rejected	13,933	365.55	537	298.17	14,470	362.51
Declined	2,888	75.77	79	43.86	2,967	74.33

In addition to the foregoing, 35 Indians were examined, of whom 25 were enlisted as scouts and 6 for regular service; 4 rejected.

Nativity of white and colored recruits accepted during the year 1900, with ratios per thousand accepted.

Nativity.	White.		Colored.		Total.	
	Number.	Ratio per 1,000 accepted.	Number.	Ratio per 1,000 accepted.	Number.	Ratio per 1,000 accepted.
United States	18,025	801.86	1,176	52.32	19,201	854.18
England	322	14.32			322	14.32
Scotland	77	3.43			77	3.43
Wales	17	.76			17	.76
Ireland	763	33.94			763	33.94
Canada	299	13.30	3	0.13	302	13.43
Other British	23	1.02	2	.09	25	1.11
France	29	1.29			29	1.29
Belgium	5	.22			5	.22
Holland	21	.93			21	.93
Denmark	77	3.43			77	3.43
Norway	63	3.69			63	3.69
Sweden	173	7.70			173	7.70
Germany	877	39.01			877	39.01
Switzerland	66	2.94			66	2.94
Austria	128	5.69			128	5.69
Bohemia	23	1.02			23	1.02
Hungary	20	.89			20	.89
Poland	22	.98			22	.98
Russia	111	4.94			111	4.94
Finland	8	.36			8	.36
Italy	40	1.78			40	1.78
Others	85	3.78	4	.18	89	3.96
Total foreign	3,269	145.42	9	.40	3,278	145.82
Grand total	21,294	947.28	1,185	52.72	22,479	1,000

Causes of rejection among 39,916 candidates for enlistment examined during the year 1900, with ratios per thousand examined.

Causes of rejection.	White, 38,115.		Colored, 1,801.		Total, 39,916.	
	Number rejected.	Ratio per 1,000.	Number rejected.	Ratio per 1,000.	Number rejected.	Ratio per 1,000.
Venereal diseases	872	22.88	97	53.86	969	24.28
Other infectious diseases	120	3.15	9	5.00	129	3.23
Diseases of the nutrition, general	42	1.10	4	2.22	46	1.15
Diseases of the nervous system	130	3.41	3	1.67	133	3.33
Diseases of the digestive system	1,195	31.35	25	13.88	1,220	30.56
Diseases of the circulatory system	1,910	50.11	42	23.32	1,952	48.90
Diseases of the respiratory organs	123	3.23	5	2.78	128	3.21
Diseases of the genito-urinary system	1,321	34.66	37	20.54	1,358	34.02
Diseases of the lymphatic system and ductless glands	34	.89	3	1.67	37	.93
Diseases of the muscles, bones, and joints	161	4.22	4	2.22	165	4.13
Diseases of the integument and subcutaneous connective tissue	327	8.58	8	4.44	335	8.40
Diseases of the eye	2,176	57.09	61	33.87	2,237	56.04
Diseases of the ear	196	5.17	6	3.33	202	5.06
Diseases of the nose	39	1.03	1	.56	40	1.00
Hernia	512	13.43	26	14.44	538	13.43
Other injuries	141	3.70	3	1.67	144	3.61
Underheight	2	.05	1	.56	3	.08
Overheight	181	4.75	11	6.11	192	4.81
Overweight and obesity	41	1.08			41	1.03
Underweight	806	21.12	20	11.10	825	20.67
Imperfect physique	2,418	63.44	90	49.97	2,508	62.83
Mental insufficiency	35	.92	1	.56	36	.90
Over age	10	.26	1	.56	11	.28
Minor	169	4.43	5	2.78	174	4.36
Married or having dependent relatives	76	1.99	7	3.89	83	2.08
Illiteracy	55	1.44	3	1.67	58	1.45
Imperfect knowledge of English	15	.39			15	.38
Reenlistment disapproved for various reasons	10	.26	7	3.89	17	.43
Character bad or doubtful	200	5.25	6	3.33	206	5.16
Reference, none or unsatisfactory	15	.39	2	1.11	17	.43
Aliens	3	.08			3	.08
General unfitness and undesirable	431	11.31	34	18.88	465	11.65
No vacancies	6	.16	2	1.11	8	.20
Unclassified	162	4.25	13	7.22	175	4.38
Total	13,933	365.55	537	296.17	14,470	362.51

VARICOCELE IN RECRUITS.

In view of the frequency of varicocele among recruits, of the infrequency of disability arising from this condition of the spermatic veins, and of the highly satisfactory results obtained by aseptic surgical intervention for its radical cure in cases in which complaint was made of an associated disability, the following circular was issued by me:

CIRCULAR }

No. 3. }

WAR DEPARTMENT,
SURGEON-GENERAL'S OFFICE,
Washington, February 27, 1901.

The attention of medical officers is invited to the accompanying papers relating to varicocele and its cure by surgical intervention. The rule laid down in Tripler's Manual should govern medical officers in the examination of recruits, viz: That a candidate for enlistment should be rejected if he has a varicocele which is larger than the sound testicle. If, however, upon a subsequent examination, after enlistment, a recruit is found to have a varicocele as large as or larger than the sound testicle and complaint is made of disability arising from it, this should not be considered a cause for discharge, but for surgical treatment.

In this connection attention is invited to the following decision published in Circular No. 11, Adjutant-General's Office, Washington, December 10, 1884:

"Except in case of a capital operation involving the risk of life, a soldier can not refuse to submit to medical treatment or surgical operation without subjecting himself to trial by court-martial for willfully avoiding treatment the purpose of which is to enable him to perform the duties for which he enlisted."

REPORT OF LIEUT. COL. A. C. GIRARD, DEPUTY SURGEON-GENERAL, UNITED STATES ARMY, GENERAL HOSPITAL, PRESIDIO OF SAN FRANCISCO, CAL., JANUARY 11, 1901.

The pubes are carefully shaved the day before operation; a soap poultice is applied and the patient kept in bed. Next morning, after the patient has been etherized, the pubes are scrubbed with soft soap and warm sterilized water, washed with warm sterilized water, then with alcohol, and then wiped dry. The finger is introduced by the spermatic cord into the inguinal canal until the external ring is felt. An incision is then made, corresponding to the axis of the canal, 1 inch long, the upper end ending over the external inguinal ring. Superficial and deep fasciæ are divided with angular scissors, preferably over a Kocher director. The vessels of the cord then come into view. The finger is passed under the cord by a little blunt separation and the cord is raised out of the wound. The spermatic duct and artery are returned as soon as possible into the bottom of the wound to prevent accidental injury. A sound vein selected for preservation to return the blood from the testicle is carefully separated from the strand of veins and carried alongside the duct. The veins are then dissected from the connecting tissue for a distance of about 2 inches, ligated with small-sized catgut at the end of these dissections, and cut off between the ligatures which are left 3 or 4 inches long. The ligatures are then tied together, the upper and lower ends of the veins being approximated, and for further safety threaded to needles and the ends united by stitches and finally anchored to the external pillar of the ring. The deep and superficial fasciæ are then carefully and separately united with a continued catgut suture, and the skin by a subcuticular suture of silkworm gut.

After a little practice this operation takes only a few minutes. The advantage over the Volkmann operation is that the seat of operation can be made absolutely sterile, which is almost impossible in the scrotum; that the scrotal tissue, being of a loose character and readily infiltrated, becomes a nidus for infection; that the scrotal scar will always be more or less tender, inconvenient and unsightly, while the suprapubic scar practically disappears, is invisible and not tender.

Sixteen cases have so far been operated on at this hospital. The men all recovered without any drawback and were returned to duty. Three of the men belong to the Hospital Corps and are now on duty at this hospital. They do not feel the slightest inconvenience from the operation, consider themselves practically cured, and there is nothing visible to show that they have ever had an operation performed. Special reports were transmitted in each case at the end of the month during which the operations were performed.

Below is a list of men showing hospital number, name, organization, and date of operation.¹

¹ It is not considered necessary to publish this list. The first reported case was operated on October 10, 1899, the last November 14, 1900.

The idea of this operation was first received from Dr. C. R. Krone, of Berkeley, Cal., although I am informed by Colonel Forwood that this had been his method of operating at the United States Soldiers' Home, Washington, D. C.

The operation is easy and, if necessary, the patient might be discharged from hospital in two or three days, while scrotal operations, as a rule, take longer to heal.

REPORT OF MAJ. J. M. BANISTER, SURGEON, UNITED STATES ARMY, UNITED STATES MILITARY ACADEMY, WEST POINT, N. Y., JANUARY, 12, 1901.

All surgeons who have been in practice a little more than a decade have seen a great revolution in the operative technic for the radical cure of varicocele. Before the advent of modern aseptic methods our attempts at the cure of this condition were bungling, imperfect, and unscientific, and as a consequence our results were unsatisfactory and uncertain. Such procedures as the amputation of the redundant scrotum; the subcutaneous passage of a silver wire around the veins, or presumably around the veins, and the fastening of the ends of the wire to a button or yoke, applied at the point of their exit from the scrotum, with a daily tightening of the wire loop until the tissues in its grasp were cut through; the subcutaneous use of a silk ligature around the veins, which was tied tightly and the knot pushed into the scrotum were recommended and practiced. All these methods I have tried, but I am free to confess that my results were not satisfactory, and in those days I never attempted the cure of varicocele with the slightest feeling of confidence. Now, thanks to modern aseptic technic, the skilled surgeon no longer works blindly, but by the open method exposes the enlarged veins, ligates and excises them to the needed extent, closes the wound, and confidently expects first union and a perfect cure. The technic which I have pursued for some years in the surgical treatment of varicocele will now be described, but I wish in advance to disclaim any originality in this matter, as in working in this line I have simply been following in the steps of Professors Halsted and Bloodgood, of Johns Hopkins University.

The patient is prepared as for any other aseptic operation requiring the administration of an anæsthetic. The day before the operation he is placed upon a liquid diet and given a saline purge. Operating, as I do, almost invariably in the afternoon for reasons of convenience, the patient early on the morning of the operation is given a cup of broth, which is to be his only food that day. He is then required to take a bath, the hair on the pubes and scrotum is shaved, and a wet bichloride dressing applied. After the patient has been etherized and placed upon the operating table the antiseptic dressing is removed, and the region of the operation, including the scrotum, is thoroughly scrubbed, first with soap and water, then with ether, and finally with a solution of bichloride of mercury, 1 to 1000. The patient is then covered with sterilized towels, the site of the proposed wound in the groin only being uncovered. The hands and arms of the surgeons and assistants having been sterilized and all those assisting in any capacity being dressed in freshly sterilized linen gowns and trousers, the surgeon commences the incision just above the spine of the pubic bone and carries it upwards and outwards for about 1½ or 2 inches, somewhat parallel to Poupart's ligament. I seldom make a longer incision than the one first designated. After dividing the skin I grasp the underlying layers of fascia with a mouse-toothed forceps in one hand, and with a dull dissector in the other tear through the layers until the external abdominal ring is exposed and the tunica propria of the cord comes into view, the layers of fascia being exposed throughout the whole extent of the wound. During this procedure the wound is held open by means of two small retractors. When the cord contained in its proper sheath has been clearly exposed the sheath is seized with the forceps and divided longitudinally, when the large veins constituting the anterior portion of the cord become visible. The vas deferens and other structures of the cord behind this group of veins must be interfered with as little as possible. This anterior group of veins should now be grasped between the fingers at the lower extremity of the wound and pulled upwards so that a portion of their extent contained in the scrotum near the upper termination of the pampiniform plexus may be brought into plain view in the wound. This can be done with the greatest ease and with the gentlest traction. What is desired by this maneuver is the drawing up of the enlarged and tortuous portion of the veins from the scrotum into the wound for ligation and excision. Having brought the veins to be treated into view, they are held by a pair of forceps in the hands of an assistant or upon a blunt hook passed under them, and an aseptic silk or kangaroo ligature is passed around them en masse at as low a point as desired, tied tightly and one end of the ligature cut off, the other end being, for the time, left uncut. The same veins are similarly treated at a point about 1½ inches higher up, and the portion included between the ligatures excised and removed. The uncut ends of the ligatures are now tied, thus drawing together the severed ends of the veins, not with the object of securing end to end union, which would be impossible, but with the expectation that the testicle will be temporarily

held up until adhesion shall have formed. After being thus treated, the veins are pushed down into the scrotum, where the ligatures can be easily felt between the thumb and finger. The wound is then closed either by interrupted sutures of silkworm gut or by a subcuticular continuous suture of kangaroo tendon, which latter is now my favorite method of closing aseptic skin wounds. The wound is dressed with dry aseptic gauze and cotton, and the whole held in place by a gauze spica bandage. The testicle, which is not covered by the bandage, is supported during the period of confinement to bed, and a suspensory bandage is ordered for constant use for a few months after complete recovery. The wound is redressed in one week, when the sutures are removed if silkworm gut has been used. The patient is allowed to sit up in ten days. For a time there will be a swelling of the obliterated veins below the ligature, but this rapidly subsides, and soon only a small lump can be detected in the scrotum.

Report of cases.—I have operated quite often in the manner described, having at times performed two varicocele operations at one sitting. The complete records of my operations performed elsewhere are not available, but I have the records of 16 operations for the radical cure of varicocele performed at West Point, N. Y., which, with the exception of case 4, are almost identical in results with those previously performed. In all my cases operated upon before my coming to West Point there was first union, a complete cure of the varicocele, and no atrophy of the testicle. This much I know, although I have not the names of the patients nor the histories of the cases at hand. The histories of the 16 cases operated upon at West Point will now be given:

Case 1.—Cadet C. B. C. Operation by high incision January 10, 1899. Result: Union per primam; no epididymitis; returned to duty with a perfect cure February 1, 1899. This cadet left West Point February 15, 1899, in consequence of graduation and is now an officer on duty in the Philippines.

Case 2.—Cadet F. P. A. Varicocele, left side. Operation by high incision March 24, 1899. Result: Union per primam; no epididymitis; returned to duty with a perfect cure May 4, 1899. Graduated in 1900 and is now an officer of the Army. This cadet remained for over a year at West Point after the operation and never had the least trouble up to the time of his departure.

Case 3.—Private R. Van V., Army service detachment. Operation by high incision performed May 29, 1899, in my presence by First Lieut. D. F. Duval, assistant surgeon, United States Army. Result: The wound healed by first union; no epididymitis. I have just examined this man, who is still on duty at West Point, and find the testicle unaffected. There has resulted, however, a small hydrocele, which gives no trouble of consequence.

Case 4.—Cadet T. N. G. This cadet was admitted to the Academy in June, 1899, with a varicocele of medium size. His military duties in camp caused the veins to enlarge very rapidly, and by August 11 the varicocele had attained a size that made an operation necessary to enable him to remain at the Academy. On the date mentioned I operated in accordance with the method described. The patient did well, the wound healed per primam, and there was no epididymitis. During convalescence the testicle was bruised several times, causing a little swelling of the gland. This cadet was returned to duty September 2, 1899. A little while after leaving the hospital he received a contusion of the left testicle in the gymnasium, which caused a decided swelling of the gland, though the injury did not give rise to an acute orchitis. I have just examined this cadet, sixteen months after the operation, and find a small hydrocele present and the testicle on the operated side somewhat larger than the other. He states, however, that he has never had the least trouble referable to the testicle or scrotum, and that he performs his military duties and exercises with ease, a condition in marked contrast to that existing prior to the operation.

Case 5.—Cadet G. R. G. This cadet was admitted to the Academy in June, 1899, with a varicocele of medium size, which, after about two months of duty in camp, became increased in size to a degree which prevented him from performing his military duties. On August 14, 1899, I operated by the method described. The wound healed per primam; there was no epididymitis; no swelling of the testicle, and in fact not an untoward symptom. He was returned to duty September 3 with an absolutely perfect cure. I have examined this cadet within the last few days, sixteen months after the operation, and find the result perfect. There is no atrophy of the testicle, no enlargement of the veins, nor any evidence that there ever has been any trouble of any kind.

Case 6.—Cadet R. C. T. This cadet was admitted to the Academy in June, 1899, with a varicocele of medium size, which rapidly enlarged in consequence of the military duties of camp until it became necessary to operate. I performed the operation on August 16, 1899. This cadet made a perfect recovery, with no complication, and was returned to duty September 3, 1899. I have recently examined this cadet, sixteen months after the operation, and find the result perfect.

Case 7.—Cadet B. B. McC. Like the three preceding cases, this cadet was admitted to the Academy in June, 1899, with a moderately sized varicocele, which rapidly increased in consequence of the duties required of him in camp until an operation became necessary. On August 19, 1899, I performed the operation as described. A perfect recovery ensued. There was no sign of any complication during convalescence. This cadet was returned to duty September 3, 1899, with a perfect cure. I have just examined this cadet, sixteen months after the operation, and find the result absolutely perfect.

Case 8.—Cadet J. P. R. Varicocele, right side. Before coming to the Academy this cadet had been operated on by a civilian surgeon for varicocele on the left side. The incision used at that time was through the scrotum. Adhesions had formed between the cord and the scrotal wound, which caused the patient inconvenience, and singularly there had resulted a tendency to sweating on this side, which would be wet with perspiration, while the other side remained dry. A troublesome varicocele having developed on the right side during service at the Academy, this cadet applied to me for operation. I performed my usual operation on October 31, 1899, which was followed by no complication, and resulted in a perfect cure. The result of the high operation stood in flattering contrast to that through the scrotal incision. This cadet was returned to duty November 28, 1899, graduated in June, 1900, and is now an officer of the Army.

Case 9.—Cadet N. C. M. This cadet applied to me in November, 1899, for relief from a troublesome varicocele, and I operated upon him November 15, 1899. The wound healed by first union, the cadet recovering without a complication and with a perfect cure. This cadet was returned to duty December 26, 1899, and graduated in June, 1900, being now an officer of the Army.

Case 10.—Private J. S. C. C., Company E, Battalion of Engineers. Varicocele, left side. The high operation was performed by my assistant, First Lieut. F. M. Kemp, assistant surgeon, United States Army, January 11, 1900. The wound healed per primam and a perfect recovery, without a complication, resulted. This soldier was returned to duty February 14, 1900, and is now on duty with his company in the Philippines.

Case 11.—Cadet V. La S. R. On January 16, 1900, I operated upon this cadet in accordance with my usual technic. He recovered without a complication and was returned to duty on February 17, 1900, with a perfect result. In June, 1900, he left the Academy in consequence of graduation and is now an officer of the Army.

Case 12.—Private A. J., detachment of cavalry. Operated upon by me February 5, 1900. This soldier was returned to duty February 21, 1900. I have examined him within the last few days, eleven months after my operation, and find the final result absolutely perfect. There is no evidence that there has ever been any abnormality in this case.

Case 13.—Cadet F. O. W. On March 18, 1900, the operation by the high incision was performed in this case. The wound healed by first union; there was no epididymitis nor swelling of the testicle, and the cadet was returned to duty cured May 19, 1900. He graduated in June, 1900, and is now an officer of the Army.

Case 14.—Cadet J. W. W. Operation performed March 8, 1900. The case progressed without a complication and the cadet was returned to duty with a perfect cure on April 21, 1900. He graduated in June, 1900, and is now an officer of the Army.

Case 15.—Cadet A. P. S. H. Operation performed March 20, 1900. There was not the slightest complication in this case, the wound healing per primam and the patient returning to duty April 18, 1900, with a perfect cure. He graduated in June, 1900, and is now an officer of the Army.

Case 16.—Private C. McI., detachment of cavalry. Varicocele, left side. Operation in accordance with the writer's technic was performed by First Lieut. F. M. Kemp, assistant surgeon, United States Army, April 10, 1900. The wound healed per primam, there was no epididymitis or other complications and a perfect cure resulted. The patient was returned to duty May 19, 1900. I have within the last few days examined this soldier and find the result absolutely perfect.

Résumé.—In reviewing the histories just given it will be seen that in the 16 cases recorded there has been first union in every case and that there has been no epididymitis as an immediate result of the operation nor any instance of atrophy of the testicle as a final sequence. A perfect result was obtained in 14 out of the 16 operations recorded. In one case, No. 4, the testicle on the affected side is at the present time, sixteen months after the operation, found to be somewhat larger than its fellow gland and a small hydrocele is discoverable. The patient, however, considers his cure perfect. Another case, No. 3, shows a moderate hydrocele, which is of no practical importance as it does not interfere with the performance of the soldier's duty.

General considerations.—Among my own cases and those of my former junior colleagues, Assistant Surgeons W. F. Lippitt, John H. Stone, and Basil H. Dutcher,

which were subjected to operation before my coming to West Point, and which are not included in the histories given above, I have never known of a single case that did not result in a perfect cure. In 1897 I saw one case, which has just been operated upon by one of my colleagues mentioned, in which the scrotum was distended with blood, presumably from a slipping of the lower ligature. This was remedied by the surgeon who performed the first operation, and I was informed that an excellent result had been secured.

It can be appreciated, therefore, that when carefully performed the operation for varicocele is one of the most successful of surgical procedures, and that its possible disadvantages are so slight as to justify the surgeon in ignoring them when called upon to decide as to the advisability of operating in a given case. The high incision with the ligation and excision of the veins is without question the ideal operation for varicocele. It has decided advantages over the incision through the scrotum with few of the disadvantages of the latter.

The advantages of the high incision are:—

1. The scrotal portion of the enlarged veins can be reached with the greatest ease through a small incision placed at the point of election.
2. The results of the operation through the high incision are better than those obtained by means of the incision through the scrotum.

Dr. Bloodgood's statistics are as follows:

"Incision in the scrotum, 16 cases. Ultimate result in these cases: Lost track of since operation, 10 cases; testicle normal, 4 cases; small hydrocele, testicle normal, 1 case; complete atrophy of the testicle, 1 case.

"Incision in the groin, 29 cases. Ultimate result in these cases: Lost track of, or recent cases, 12 cases; no atrophy of testicle, 12 cases; hydrocele, 5 cases; atrophy of testicle, 0 case. Healing of wounds, scrotal incision per primam, 12 cases; suppuration, 4 cases. Healing of wounds, incision of groin, per primam, 27 cases; suppuration, 2 cases."¹

3. First union can almost certainly be counted upon in the high incision. In my personal experience I have invariably secured union per primam in my varicocele wounds when located in the groin.

The disadvantages of the incision through the wall of the scrotum are the following:

1. The difficulty of securing perfect asepsis, owing to the locality of the wound.
2. The tendency of the contractions of the dartos to drag on the wound, causing gaping, thus opening the way for pyogenic infection.
3. Greater liability to atrophy of the testicle.

Referring again to my own statistics, I can say that I have never seen a case of epididymitis or atrophy of the testicle resulting from a varicocele operation performed by me. My results have been absolutely perfect, except in case 4, where traumatism occurred during and after convalescence, and in the case cited the relief from former inconvenience is at the present time so great that the patient considers himself cured.

I conclude this paper by advancing the following propositions:

1. The operation for the radical cure of varicocele by the high incision, with ligation and excision of the veins, is one of the most successful of surgical procedures.
2. The operation is without risk to life in the case of a patient without disease of vital organs.
3. That it is well adapted to the military service.
4. That no soldier otherwise sound should be discharged from service on account of varicocele.
5. That it should be the duty of the medical department of the Army to cure these cases, compelling compliance on the part of the soldier where objection is urged.

REPORT OF CAPT. W. C. BORDEN, ASSISTANT SURGEON, UNITED STATES ARMY, UNITED STATES GENERAL HOSPITAL, WASHINGTON BARRACKS, D. C., FEBRUARY 9, 1901.

I have operated for varicocele in twenty-two cases, and have used two methods—subcutaneous ligation and excision. The cases by subcutaneous ligation were thirteen in number and were done several years ago. This method I no longer consider worthy of consideration, as it has been entirely superseded by the more accurate and satisfactory method of operation by excision.

Operation by the open method with excision of the veins.—In operating by this method one of two incisions may be practiced—above the pubes over the external inguinal

¹See Dr. Joseph C. Bloodgood's paper in "The Johns Hopkins Hospital Reports, Vol. VII," page 350.

ring or through the front of the scrotum. I have used both incisions, having operated about an equal number of times by each, and believe the suprapubic method to be by far the safer for general work; but in certain cases, where the scrotum is quite long and relaxed, I prefer the incision through the scrotum when I am absolutely sure of my asepsis. The operation for varicocele is one which requires extreme care in the aseptic technic, and this is particularly the case if the operation is done through the scrotum, as the laxity of the tissues, the deep rugae of the skin, and the deep sebaceous glands in this region tend to harbor infection, which if it occurs is invariably followed by prolonged suppuration and sinuses which have no tendency to heal, thus necessitating a secondary operation. Aside from the prolonged suppuration which follows infection, this is dangerous to the testicle in that the inflammation about the blood vessels may seriously interfere with the organ or may even infect it and produce atrophy.

In my nineteen cases operated upon by the open method primary union was obtained in all but one case. This case was operated upon by the scrotal route. It occurred at this hospital, and was the first surgical case I operated on here. At that time the conditions were not favorable to absolute aseptic work, and this, in connection with the incision through the scrotum, accounted for the infection. Fortunately the infection was not severe, and I am inclined to believe that, other conditions being equal, had the operation been done by the suprapubic route no infection would have occurred. With asepsis thoroughly under control the scrotal route may be chosen in certain selected cases, especially in those in which the scrotum is elongated, for by sewing the incision transversely the scrotum may be shortened. But as the main danger in the operation for varicocele arises from infection of the wound, the suprapubic method is to be preferred when most rigid asepsis is required.

Aseptic technic.—The patient is prepared by shaving the pubes, scrotum, and adjacent parts and applying a dressing of green soap the night before the operation. Green soap is preferred to a bichloride dressing in that it loosens the epidermis and allows a thorough cleansing. The patient having been placed under an anaesthetic, the parts are thoroughly scrubbed with green soap. They are then rinsed with sterile water, scrubbed with alcohol, then with bichloride solution 1:1000 and rinsed with sterile water. The penis is carefully enveloped in a sterile cloth, and the operator and his assistants all wear rubber gloves. I now use rubber gloves in all my operations, and consider them of the greatest value in furthering asepsis.

The operation by the suprapubic route.—The incision is made above the pubes and over the external inguinal ring, nearly parallel to Poupart's ligament, and about an inch and one-half in length. It is carried down until the external ring is exposed and the cord brought into view. The sheath of the cord is now opened and the veins which lie at the anterior portion of the cord are seen. In varicocele the enlarged veins lie at the anterior part of the cord and in front of the vas deferens and spermatic artery. If care be taken these veins can be lifted up and away from the vas deferens and artery and isolated from the latter by passing a blunt hook beneath them. Having done this, the veins can be separated by blunt dissection from the underlying structure of the cord well down toward the testicle by pulling them up as the dissection proceeds. Having done this, the operator should determine the position of the vas deferens and artery to be sure that he does not include them in his ligature. The veins being brought well out through the incision, a ligature is passed about them above and another ligature is tied about them below well down toward the testicle. The intervening portion is excised and the cut ends approximated and tied together by the ligatures. The wound is now closed by a subcuticular suture of catgut, covered with sterile gauze, cotton, and a spica bandage.

Dangers of the operation.—The danger of infection has already been discussed. The remaining danger is atrophy of the testicle from inclusion of the vas deferens or spermatic artery in the ligatures. This the operator must be careful to avoid, and is easily done by careful attention to the structures involved before the ligature is passed.

Operation by the scrotal route.—As before stated, this operation is not advised except in special cases and when the operator is absolutely sure of his aseptic technic. The operator, standing on the left of the patient, grasps the cord between the thumb and forefinger of his left hand, pressing the cord up to the anterior surface of the scrotum and holding the testicle retracted in the palm of his hand. Holding the knife in his right hand, he makes an incision about an inch long through the skin and cuts carefully down to the cord which he is pressing upward with the left thumb and forefinger. By holding the cord firmly to the front of the scrotum in the manner indicated and cutting carefully, the distended veins are soon brought into view, and this with much less dissection and consequent disturbance of the tissues than occurs

when the incision is made into the body of the scrotum and the cord searched for. The veins having been brought into view the operator, still holding the cord to the front with his thumb and forefinger, frees them to a sufficient extent to pull the cord out of the incision. Having done this, he holds aside the vas deferens and separates it from the enlarged veins. The most difficult part of the operation now begins. The operator, grasping the cord, feels for the pulsation of the artery, and having found it dissects the artery free from the veins. This is sometimes quite difficult and troublesome to do, but the artery should by no means be included in the ligature with the veins, as atrophy of the testicle will very probably result. Having separated the vas deferens and artery from the veins, the latter are freed well down to the testicle and well up to the external inguinal ring. A catgut ligature is then passed around the veins above and tied, the ends of the ligature not being cut off. The veins are ligated below in a similar manner and the part between the stumps excised. The stumps are approximated and tied together, using the ends of the ligature for this purpose. This raises the testicle higher in the scrotum than it was before the operation and does away with the sagging of the organ. The skin wound is closed by subcuticular catgut suture or with interrupted suture of horsehair. A dressing of sterile gauze covered with absorbent cotton is placed over the closed wound and a suitable bandage is applied.

Results of operations.—The results of the operation are always good, provided it is done aseptically and the operator does not include the vas deferens or spermatic artery in his ligature. In my 19 cases I had one infection which, as stated before, was slight and did not lead to any serious trouble. So far as I know there was no atrophy of the testicle in any case and the cure was radical in all.

General conclusions.—As a result of my experience I am of the opinion that a varicocele which produces disability and which has originated in the service should not be considered a cause for a discharge, but should always be operated upon provided the operator is so situated that he can be reasonably sure of asepsis.

Report of Capt. A. E. Bradley, assistant surgeon, United States Army, Fort Snelling, Minn., December 22, 1900.

A description of the method of operation in these cases can not be found in any text-book available, but I am not prepared to claim that it is new. I was prompted to employ it in the first instance in the case of a soldier concerning whom the surgeon of his post persistently claimed the existence of hernia. Reports of this case, Private C. R. L., Troop H, First Cavalry, were forwarded August 15 and October 26, 1900.

In view of the opinion of the surgeon at Fort Meade, S. Dak., it was deemed advisable to expose the inguinal canal and the abdominal rings and at the same time operate for the varicocele, the existence of which was evident. An incision about 2 inches long was made in the line of the inguinal canal well down toward the base of the penis. The cord was exposed external to the external ring and easily drawn forth with the mass of varicose veins. The testicle itself was drawn out and fully exposed with great ease. The veins were excised, the stumps drawn together shortening the cord, and the testicle replaced. The abdominal rings and the canal were found normal. A few catgut sutures closed the deeper structures and subcuticular silkworm-gut suture the skin incision. A collodion dressing was applied, and convalescence was normal.

Case 2.—Trumpeter L. E. S., Troop G, First Cavalry, was admitted from Fort Yellowstone, Wyo., October 20, 1900, for operation for varicocele. In view of the ease of operation, as I found it in L.'s case, I determined to use the same method. The usual preparations were made, and I operated October 21, 1900. A small incision was made as before, the cord exposed and dragged up and out, the veins ligated and excised, without, however, delivering the testicle out of the incision. The wound was closed as in the first case, and the result was perfectly satisfactory.

Case 3.—Sergeant J. W. M., Company A, Eighth Infantry, was admitted to hospital October 8, 1900, for chronic sciatica, and while in hospital expressed a desire to be operated upon for varicocele. Operation was performed as in case 2 with a perfect result.

I believe this method to have advantages over the scrotal method. There is greater probability of perfect preparation and less danger of wound infection. The wound is well up on the pubes and away from sources of infection.

The difficulty of avoiding wound infection in scrotal work is well known. Owing to the thin and relaxed walls of the scrotum and the cremaster action, it is difficult to keep perfect apposition of the parts divided in the scrotal operation. In the high operation this is avoided.

EXTRACTS FROM A PAPER BY LIEUT. COL. NICHOLAS SENN, CHIEF SURGEON, UNITED STATES VOLUNTEERS, CHIEF OF OPERATING STAFF WITH THE ARMY IN THE FIELD, FROM HIS WORK ON THE MEDICO-SURGICAL ASPECTS OF THE SPANISH-AMERICAN WAR.

For years I have been convinced that too many operations are being performed for varicocele, and I have always advised my students to limit operative intervention to the exceptional cases in which well-marked symptoms warranted such a course. Most of the persons suffering from this affection that apply to the surgeon for treatment are sexual neurasthenics, young men who have made a deep study of this subject with the aid of quack literature. In the great majority of cases the symptoms presented are due to a morbid mental condition rather than the varicosity of the spermatic veins. I have frequently observed that the size of the varicocele bears no relation to the degree of suffering and distress complained of by the patients. Recent experience has only confirmed my views concerning the relationship of varicocele to the subjective symptoms associated with this condition. During the month of May I had, as a member of the examining board, an opportunity to examine, at Camp Tanner, Springfield, Ill., 9,815 recruits for the volunteer service. I took special pains to investigate varicocele as a cause of disability. From the very beginning I was surprised at the prevalence of this affection. I classified the cases according to the number and size of the varicose spermatic veins into (1) small varicocele, (2) medium-sized varicocele, (3) large varicocele. The disease was found more frequent in the robust strong than in men of slight build. In most instances the men were otherwise in excellent condition. Atrophy of the testicle was seldom noted. The subjects of large varicocele were invariably questioned as to whether or not this pathologic condition gave rise to discomfort or pain, and, with the exception of three or four cases, the replies were always negative. In more than half the cases that presented themselves the men were ignorant of the existence of the affection. * * * The result of these observations led me to the conclusion that varicocele is very seldom a cause of disability for military service, and that operative treatment is rarely indicated. This short communication is made for the distinct purpose of calling attention to the frequency with which varicocele is met with in otherwise healthy and robust subjects, and in formulating a serious and positive protest against the too frequent recourse to operative interference so common with surgeons of all grades and in all civilized countries.

The following table shows that of 9,815 recruits examined 2,078 were affected with varicocele—that is, 21.17 per cent. * * * These statistics are absolutely reliable and fortify my position taken in this paper that varicocele in varying degrees is met with in nearly one out of four men between the ages of 18 and 30 years, and that of itself it seldom gives rise to any noticeable disturbance, and that the patients who apply for treatment do so in consequence of nervous disturbances entirely separate and independent of the enlarged spermatic veins. I am satisfied that in many of these cases an operation is superfluous, provided the surgeon can secure the full confidence of the patient, which is an essential prerequisite to successful treatment short of an operation. For my own part I shall not perform as many operations for varicocele since I have had an opportunity of studying the pathologic and clinical features of this affection on such a large scale.

GEO. M. STERNBERG,
Surgeon-General, United States Army.

IDENTIFICATION OF DESERTERS AND OTHER UNDESIRABLE MEN.

From July, 1890, the time of the first identification, to June 30, 1901, 2,298 identifications have been made; 18 in 1890, 111 in 1891, 215 in 1892, 104 in 1893, 110 in 1894, 121 in 1895, 108 in 1896, 68 in 1897, 347 in 1898, 480 in 1899, 351 in 1900, and 265 during the first half of 1901.

Of the 1,682 men identified up to the end of 1899, 401 were retained in service, 844 were discharged from the Army, and 437 deserted. The disposition of the men identified during 1900 can not be given, owing to a number of cases being still under investigation.

HOSPITALS.

During the year the general hospitals in Manila, P. I., which were fully described in my last annual report, pages 108-116, have been in excellent condition and the departmental hospitals compare favorably

with them. Both were outfitted with all modern equipments. Regimental hospitals of varying capacity have fulfilled their purpose as emergency hospitals, but in progress of time as the troops become established in permanent posts these regimental hospitals will have to give place to carefully organized post hospitals.

The Second Reserve hospital, which was established in a brick building formerly used as a boarding school for girls, was closed July 1, 1901, and its patients, hospital-corps men, and nurses transferred to the Santa Mesa hospital. Its equipment was in part distributed to other hospitals and in part placed in store in the medical-supply depot.

The full equipment of a 100-bed hospital was established at Nagasaki, Japan, in January, 1901, with a sufficient personnel, Capt. I. W. Rand, assistant surgeon, United States Army, in command. This was intended for the purpose of taking from passing transports sick and wounded men who were not in condition to continue the voyage to or from the United States.

The post hospitals built at the new posts in Cuba are such as to give the sick soldier all the advantages of modern treatment with the best hygienic surroundings. They consist of frame pavilion buildings with free ventilation, double roofs and wide porches, the wards large, to give unrestricted air movement. None of the old Spanish stone hospitals are now in use except at the post of Holguin.

Excluding from consideration the Army and Navy General Hospital, Hot Springs, Ark., and the general hospital, Fort Bayard, N. Mex., supra page 13, both of which are devoted to special lines of medical work, there have been during the past year only two general hospitals in service in the United States: The general hospital at Washington Barracks, D. C., having a capacity of 50 beds, and the general hospital at the Presidio of San Francisco, Cal., with a capacity at the present time of 650 beds, but susceptible of a prompt extension to meet emergencies. The latter hospital is the home depot for the reception of invalids from the Division of the Philippines. The report from this hospital is given below:

REPORT OF THE UNITED STATES GENERAL HOSPITAL, PRESIDIO OF SAN FRANCISCO, CAL., FOR THE FISCAL YEAR ENDING JUNE 30, 1901, LIEUT. COL. A. C. GIRARD, DEPUTY SURGEON-GENERAL, UNITED STATES ARMY, COMMANDING.

In the annual report of this hospital for the year ending June 30, 1900, a brief history of its establishment was given, together with a detailed description of the buildings. During the past year the power house, including the ice and refrigerating plant, heating and electric system, and laundry, have been completed and put in operation. There has also been completed a building at the southern end of the patients' mess hall which will be used as a chapel and library for the hospital. The large number of patients received during the year has necessitated the use of six wooden barracks belonging to the post, which have been pretty constantly occupied.

On June 10, 1901, the northeast portion of the hospital was destroyed by fire. This portion included the following buildings: Patients' dining room, patients' kitchen, bakery, cold-storage room, medical storeroom, ordnance storeroom, quartermaster storeroom, carpenter shop, paint shop, hospital corps dining room and kitchen, ward F, tent hospital for 45 tents, lavatories and tent hospital, and a portion of ward G. The losses occasioned by this fire will be more fully referred to in another portion of this report.

In preparing the report of the hospital it has been thought best to divide it into the following sections: The general administration, medical work of the hospital, surgical work of the hospital, certificates of disability, eye, ear, nose, and throat clinic, bacteriological laboratory, X-ray laboratory, and report upon insanity. In this way a more thorough knowledge of the immense amount of work which has been accomplished during the year can be gained, and the facts pertaining to each department grouped in their proper places.

General administration.—There have been but few changes in the administration of the hospital during the year. The detailing of a permanent staff of medical officers has greatly facilitated and increased the accuracy and value of the work. In a hospital such as this, where the patients arrive at irregular intervals and in large numbers, it is impossible to satisfactorily conduct the service without a certain number of permanent medical officers. At times the influx of large numbers of patients within short intervals has severely taxed the administrative work of the hospital. This has been especially true during the last three months of the fiscal year, during which time the United States Volunteers were being mustered out of the service.

I. Report of the quartermaster.—The following statement shows the purpose, amount authorized, and amount expended in repairs, alterations, and improvements made or in progress at the hospital during the fiscal year:

Date authorized.	Amount authorized.	Amount expended.	Purpose.
QUARTERMASTER-GENERAL'S OFFICE.			
Apr. 17, 1900.....	\$1,891.26	\$1,891.26	From funds fiscal year 1900 for tin roofing verandas.
May 3, 1901.....	500.00	450.00	For painting verandas and railings and calclmining hospital corps and nurses' quarters.
July 27, 1900.....	1,720.00	1,747.25	For general repairs, materials, and labor.
Nov. 6, 1900.....	200.00	200.00	For materials and labor for installing tub, closet, and washstand in administration building.
Nov. 15, 1900.....	135.50	97.20	Laying floor under diet kitchen.
June 14, 1901.....	75.00	75.02	For repairing roof, Ward G.
Mar. 21, 1900.....	384.00	405.60	From funds fiscal year 1900 for laying tile and lowering floor in operating room.
Oct. 5, 1900.....	21.60		For adjusting blow-off to boilers.
Oct. 4, 1900.....	47.50	47.50	Installing additional laundry machinery.
Oct. 8, 1900.....	325.00	325.00	For laying surface guttering.
Feb. 16, 1900.....	214.60	214.60	For making changes to water system.
May 9, 1901.....	434.38	381.89	

Total expended from funds fiscal year 1900..... \$2,296.86
Total expended from funds fiscal year 1901..... 3,538.46

A new chapel has been constructed by the chief quartermaster, Department of California, at a cost of \$2,700.

In addition to the work done for which allotments were made the roadways about the hospital have been graded with cinders and rolled, the inclosures in the rear of the hospital fenced (this work being done by enlisted men), and the grounds about the hospital surfaced, properly graded, and sown with blue-grass seed. A tent hospital of fifty beds was established, the floors and walls being of wood. Electric lights were placed in each tent, two lavatories built for use of same, the plumbing system connected, and sidewalks laid in front and rear of the wards.

The floor of the operating room was lowered and a tile floor put in. The floors of the diet kitchen were reenforced to keep them from settling, on account of the heavy concrete floor, while those of the wards and administration building and patients' mess hall were polished with hard oil finish. An additional bath tub, water-closet, and washstand were installed on the second floor of the administration building. The sewer pipe in the rear of the administration building was found to be too small, easily becoming clogged, and was replaced by a larger one. About 715 feet of brick guttering has been laid during the year, greatly improving the sanitary condition of the hospital.

The installation of the steam, electric light, laundry, and refrigerating plant has been one of the most valuable additions to the hospital. Not only has this plant proven of great value because of the promptness and ease with which the work has been executed, but also because it has resulted in a great financial saving to the hospital. The following table will show the monthly cost of operation of the plant, together with the former cost of the work which it performs and the resulting monthly saving. Plant began operation August 28, 1900.

Monthly cost of operation:

Engineers.....	\$180
Firemen.....	100
Laundrymen.....	55
Laundrywomen.....	50
Oil, repairs, ammonia.....	75
Coal.....	700

Total..... 1,460

Cost per month before installation of steam, electric-light, laundry, and refrigerating plants:

Average cost of lighting per month (figures furnished by quartermaster's department)	\$940. 62
Average cost of laundry	918. 42
Average cost of ice (figures furnished by subsistence department)	74. 28
Total	<u>1, 933. 32</u>
Former cost	1, 933. 32
Present cost	<u>1, 180. 00</u>
Monthly saving	773. 32
Saving in laundry for post, transports in harbor, etc	<u>500. 00</u>
Total monthly saving	<u>1, 273. 32</u>

The laundry, which was opened August 23, 1900, and in which the laundry work of the general hospital, the hospitals of all the posts in the vicinity of San Francisco, and of all transports plying between San Francisco and Manila, is in the charge of a hospital steward, and employs one chief laundryman, two women, and four hospital corps men eight hours daily.

Its machinery consists of three 150-sheet washers, one 24-inch and one 20-inch centrifugal extractor, two mangles, each with one 64-inch cylinder and two 11-pound electric irons, all of which are operated by a 15-horsepower electric motor.

The steam drying room has nine compartments and occupies a floor space of 7 by 8 feet, and is capable of drying 1,000 sheets per day. Each morning the soiled linen is collected from the wards and exchanged from the linen room at the laundry for clean. Each afternoon, after these soiled articles are washed, they are counted and stored in the linen room to be issued again the next day. In this way each article of linen is daily accounted for. The average daily output is 2,500 pieces to laundry, which requires 50 pounds of soap, 10 pounds of caustic soda, 10 pounds of chlorid of lime, and 1 pint of blueing.

The following transportation has been furnished by the quartermaster during the year:

Patients to Fort Bayard, N. Mex	124
Patients to Hot Springs, Ark	216
Patients to various stations	70

Total patients	<u>410</u>
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All other transportation	225
Transportation for messengers	805
Packages transferred	<u>1, 326</u>

During the year the quartermaster has issued clothing to patients and detachment of hospital corps to the value of \$12,967.28.

The following is a statement of the funds pertaining to the quartermaster department expended during the fiscal year:

Regular supplies	\$5, 016. 87
Incidental expenses	384. 40
Army transportation	1, 257. 05
Barracks and quarters	2, 800. 67
Clothing and equipage	<u>10. 00</u>

Total	<u>\$, 268. 99</u>
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II. *Report of the commissary officer.*—The number of rations issued during the year has been 87,752. The average number of men and women to whom rations were issued has been 238.

The following disbursements were made during the year:

Paid for food supplies	\$56, 623. 40
Commutation of rations	5, 081. 00
Paid for fresh beef (under contract), savings, labor, etc	<u>6, 910. 64</u>

Total expended during year	<u>68, 615. 04</u>
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The average number of patients supplied has been 447, and commutation of rations has been paid to 825 men.

III. *Property office.*—The work in the property office has been under the charge of a contract surgeon, United States Army, who has been assisted by one acting hospital steward and two privates of the hospital corps, one acting as property clerk and the other as storekeeper. The handling of the medical property has been conducted in the following manner:

Requests for supplies have been put in every two weeks. On receipt of supplies from the supply depot they have been carefully checked over with the packer's list by either the steward or storekeeper, and the supplies then placed in the storeroom, from whence they are only issued by orders signed by the ward surgeons and O. K.'d in the property office. Upon arrival the drugs were turned over to the dispensary storekeeper. The property storekeeper sends to the office his report of daily issues, when the invoices are then made out by the clerk and signed by the property officer. The ward officers and those in charge of the various departments render a monthly statement of property received, disposed of, and lost, and these reports are then checked over with the invoices and receipts, and the losses covered by affidavit. The invoices from the medical supply depot are carefully compared with the packer's list, and receipts, after being also compared, are signed by the commanding officer.

The fire June 10, 1901, originated in such close proximity to the storerooms that practically the whole stock on hand was destroyed. Since the fire the storeroom has been located in one of the wards, where one or more of the men connected with the property office always remain.

IV. *Dispensary.*—The dispensary is in charge of one acting hospital steward and two privates of the hospital corps. It is open from 6 a. m. to 9 p. m., and during the night one man remains subject to calls from the bell attached to the outer door. The dispensary is thus accessible for emergencies at all hours.

In addition to drugs upon the supply table there are carried in stock about 150 medicines. The medicines and liquors, with the exception of small quantities used from day to day, are arranged according to the supply table in the storeroom designated for that purpose.

A stock book has been kept showing amount on hand the first of each month, the amount received, and the amount expended, thus enabling the steward in charge of the dispensary to render requisitions for medicines needed without carrying any excess of stock on hand. A liquor book is kept which contains an accurate report of alcoholics used in each ward during the month and the date of each issue. A monthly report is rendered to the executive officer, while the original prescriptions for liquors are retained on file in the book kept for that purpose.

All prescriptions are written in the metric system, and except in cases of emergency presented at the dispensary before 10.30 a. m. Each ward is furnished with a suitable receptacle for carrying medicines from the dispensary and each prescription bears the name of the ward for which it is intended. During the fiscal year the average daily number of prescriptions dispensed has been 200.

V. *Record Office.*—The personnel of the record office is as follows: One hospital steward, in charge; 1 acting hospital steward, 10 clerks, and 1 orderly.

The following records and books are kept: Register of patients, regulars; register of patients, volunteers; index to register of patients; "letters received" book, with index; "letters sent" book, with index; consolidated morning report book; record of deaths and interments; record of summary court; monthly report of sick and wounded; monthly post return; file of retained copies of S. C. of D.; descriptive and clothing book, with index; muster and pay rolls; file of clinical histories of patients, together with copies pathologist's report of sputa, blood, feces, and urine examinations; records of cases tabulated under headings in accordance with classified lists of causes of admissions to sick report as laid down in the Manual for the Medical Department.

One hospital steward acts as chief clerk and is responsible for the proper conduct of the clerks in the office and for the proper preparation and filing of records.

One acting hospital steward (1) has charge of surgeon's certificates of disability. (2) Prepares file cards showing under headings in accordance with classified lists cause of admission to sick report as laid down in the Manual for the Medical Department, with the hospital number of each case. These hospital numbers are entered on the cards in black ink in the cases of regulars, and red ink in the cases of volunteers. Thus upon reference to the file cabinet the card headed with any one disease or injury shows at a glance, not only how many cases under that heading have been treated at the hospital, but also the hospital number of each case for immediate reference to register of patients. (3) Arranges and keeps file of clinical his-

stories of patients and prepares for file therewith copies of the pathologist's reports of sputa, blood, feces, and urine examinations.

One clerk is detailed in charge of the "letters received" book and furloughs.

One clerk in charge of "letters sent" book, summary court record and ledger, showing valuables deposited by patients.

One clerk (1) has charge of consolidated morning report book and daily numerical report book by organizations. He also prepares a daily list from his books of the number of patients in hospital who live on 40 cents per day; the number of discharged soldiers for whom rations are drawn; the number of quartermaster employees and retired soldiers to be charged 40 cents per day, and the number of officers who are to pay \$1 per day for subsistence. (2) Prepares monthly post return.

One clerk has charge of descriptive lists of patients and superintends the preparation of final statements, discharges, and new descriptive lists.

Two clerks prepare under the direction of the clerk in charge, who must be a good accountant, discharges, final statements, and descriptive lists; keep the clothing book of patients, and prepare clothing schedule of patients.

One clerk has charge of the register of patients, prepares monthly report of sick and wounded, keeps record book of deaths and interments, and prepares transfer slips for patients transferred.

Two clerks (1) keep record of pay, clothing, etc., of patients and note all changes as they occur on card-index register, from which, when a patient is ordered discharged or otherwise disposed of, all necessary data for the preparation of final statements, etc., are furnished. (2) Prepare pay and muster rolls of patients from the card-index register.

One orderly, used as a messenger, keeps files of the orders and circulars, cares for the circulating library, and polices the offices. This force under ordinary circumstances will be able to perform the work of a 400 to 600 bed hospital, but occasionally there is a demand for a large amount of work, such as discharging volunteers "services no longer required" or on surgeon's certificate of disability, which calls for a temporary increase.

VI. *Patients and hospital corps mess.*—The personnel of the mess department of the United States Army general hospital, Presidio of San Francisco, Cal., consists of a mess officer, who has under his charge 1 hospital steward, 1 acting hospital steward, 2 civilian employees, and 20 privates of the hospital corps. It includes 2 kitchens and 2 dining rooms for the patients, a kitchen and dining room for the hospital corps, and a mess storeroom, from which supplies are issued to the kitchens and wards. It also includes a bakery, which employs 1 civilian baker and 1 to 2 hospital corps men when in operation.

The duties of the hospital steward of the mess consist in supervising the details of preparation of diets for the sick, the cooking for the hospital corps, and the management of the bakery. He receives and checks all food supplies for the hospital in the mess storeroom and accounts for them in a proper form of receipt. Upon the requisition of the ward surgeon and cooks, he issues these supplies daily at a stated time; the requisitions are his vouchers for dropping the supplies on proper forms of supplies issued. He prepares daily a morning report, showing the number of patients in hospital and the allowance to be expended per day. This report also shows the daily total amount expended and the balance or deficit for the day. A supplementary report, showing the daily expenditures in detail, accompanies this form. Daily trips are made with a market wagon to the city to purchase fresh fruits, vegetables, butter, and eggs. Extra supplies, not kept in the commissary, are purchased from various firms in the city by bid forms under the direct supervision of the commanding officer.

During the year ending June 30, 1901, an average of 466 patients were fed daily from the diet kitchen of the general hospital, and in addition 1,935 casualties were fed who passed through the hospital for examination (after arrival in transports from the Philippines).

Recently difficulty has been experienced in maintaining the high standard of diet adopted at this hospital from the allowance of 40 cents per day for each enlisted patient. This is due to the large decrease of enlisted patients with the allowance of 40 cents per day and the increase of patients as discharged soldiers too sick to travel, who were allowed but a ration in kind yet actually required the same special diet furnished other patients. The number of these patients increased upon the muster out of each regiment until the actual allowance per patient per day was but 31½ cents, computing value of the ration in kind furnished to muster-out patients at 15 cents per ration. In addition extra quantities of food were frequently required by wards in excess of the number of patients reported. This was corrected by a circular order published July 28, 1900, as follows:

"PAR. 1. Attention of the ward officer is invited to the numerous discrepancies occurring on their 'special diet list and diet orders,' the number of special diets reported on the diet order not corresponding with the number of special diets asked for on diet list.

"Hereafter the number of special diets asked for must not exceed the number of patients who are actually on such diet in the wards.

"Patients on liquid diet requiring articles of special diet will be classed as special, instead of liquid. It is thought the amount of food furnished for each diet is ample and sufficient, and the practice of asking for an excess above the number of diets required is not necessary."

As per diem allowance per patient was continually decreased under the influence of a continuous increase of discharged soldiers and a decrease in the 40 cents per diem patient, it becomes necessary to modify the diet table, and the following orders were issued on May 17, 1901, and a substitute special-diet table published:

"PAR. 3. The daily order list of special diet, form No. 20, is suspended until further orders.

"Ward surgeons will hereafter use the diet order only, showing the number of liquid, special, light, and full diets required for the current day. All patients will be sent to the mess hall for meals as soon as able to eat the prescribed full diet."

At the same time the light and full diet orders were modified to meet the existing conditions.

Two kitchens and dining rooms have been kept in operation for the use of the patients. A third kitchen is operated for preparing food for contagious cases whenever required. The kitchens and dining rooms are under the immediate direction of an acting hospital steward. One chief cook, at \$60 per month, and one assistant cook, at \$40 per month, are employed in this kitchen. Five privates of the hospital corps are on duty in the kitchen and three privates of the hospital corps in the dining room at the general hospital proper. Two privates of the hospital corps are on duty in the auxiliary kitchen at the wooden barracks. The number of men employed in these kitchens and dining rooms are increased and reduced according to requirements of the service. In addition, two privates of the hospital corps are on duty in the mess storeroom. Three men on duty in the dining room have the police and care of all things pertaining to that room.

During the year four steam-jacketed boilers for cooking soups, meats, etc., two steam kettles for cooking vegetables, one egg boiler, and two 60-gallon urns for tea and coffee, with 80-gallon urn for hot water, were placed in the kitchen, making it one of the best-equipped hospital kitchens on the coast.

The food carriers for the wards and dining rooms, which were designed by Lieut. Col. A. C. Girard, deputy surgeon-general, United States Army, rendered efficient and valuable service as conveyances, and have proved so valuable that no change from the original model, except as to size and pattern of wheels, could be suggested. These have been modified in the new cart now in use.

The efficiency of the personnel of the hospital corps and civilians on duty in the kitchen and dining rooms is excellent, each individual being especially adapted to the duties he performs. The work in the kitchen, preparing the various diets and serving the same, is well and expeditiously performed.

During the year, load after load of transport sick have passed through this hospital, hundreds simply passing through for examination. All, however, were fed as soon as they arrived at the hospital. The men have frequently prepared a dinner or supper on less than an hour's notice to 450 new arrivals, and this without deviation from the regular bill of fare.

When the kitchens and dining rooms were destroyed by fire at 4 p. m., June 10, 1901, and all food on hand was burned, a new kitchen was opened, new supplies purchased and cooked, and supper served at 7 p. m., only one and one-half hours later than the schedule time.

During the twelve months from July 1, 1900, to June 30, 1901, these men prepared and served 510,839 meals.

Meal tickets are used for patients messing in the dining room. A check is kept on these by entering the number received at each meal from the respective wards and comparing this number with the ward diet orders.

The bakery connected with the kitchens did good work during the year, the bread baked being of superior quality. Two grades of flour are used in baking—the issue flour and family flour. In addition, 3 gallons of skimmed milk are used for each 150 loaves of bread. The bread made is of an even, fine texture, white, and does not dry out as readily as the ordinary post bread.

An ice plant at the hospital furnished sufficient ice for the needs of the hospital. In addition thereto a cold-storage room is located in the basement of the kitchen for the preservation of meat and other perishable articles.

Milk is delivered at the hospital daily at 6 a. m. and 11.30 a. m. It is tested for purity and cream once a week in the laboratory, and has always been found to be of a high standard. A large amount of milk is employed in the preparation of koumiss, in which form it is given to many patients.

When yeast for koumiss is desired by ward surgeons it is ordered from the mess steward twenty-four hours in advance of the time when it is desired for use. Orders state the number of bottles of koumiss to be made. The required amount of yeast will then be furnished.

On June 10, 1901, the entire culinary department of the hospital was destroyed by fire. The destruction included the patients' kitchen and dining room, hospital kitchen and dining room, the mess storeroom, the bakery, cold-storage room, and vegetable storeroom. Everything was destroyed by this fire. So rapid was its spread that nothing could be saved. Immediately after the fire, ward H was temporarily fitted up as a kitchen and dining room and is now in use as such until the completion of the kitchen and dining room, which are being rebuilt.

Bread has been purchased from a city bakery at a cost of 3 cents per loaf, since the date of the fire. It is expected that the bakery will reopen within a few weeks.

The hospital corps kitchen and dining room have been moved to barracks No. 5 of the auxiliary hospital buildings in the post proper. The food of the hospital corps is varied as much as possible by addition of fresh vegetables and fruits and change of meats. It is well cooked, of an excellent quality and sufficient variety.

The female nurses have a separate kitchen and dining room from the hospital corps, under charge of a nurse. A woman cook and two Japanese waiters are employed. The savings of rations of female nurses and a small percentage of money received from sick officers for board is allowed their mess and credited on the hospital fund statement. The amounts so credited are expended for their benefit under the supervision of the nurse in charge of the mess. Any excess of expenditures which may be incurred is met by a voluntary individual assessment levied upon themselves.

VII. *Telephone and telegraph department.*—Connected with the hospital is a regular Western Union telegraph office, as well as a city official telephone and a pay telephone. Besides these, there are three local systems.

System No. 1: System No. 1 connects the general hospital with the auxiliary hospital, the lower corrals for the use of ordering ambulances, conveyances, etc., and to the hospital electric and heating plant, and the office of the steward in charge of the mess. The lines and instruments used in this system belong to the signal department of the United States Army.

System No. 2: A local system connecting all the offices of the hospital, commanding officer, executive officer, chief nurse, record office, quartermaster's office, officer of the day, hospital corps detachment, hospital kitchens, and ten wards. This system is entirely confined to the general hospital, and the lines and instruments used are the property of the Signal Department of the Army.

System No. 3: This system, known as the Presidio local exchange, connects the general hospital with the post hospital, Presidio, Presidio post headquarters, and the quarters of the commanding officer of the hospital. This system is connected with the Presidio post exchange, whereby the general hospital can be connected with all the offices and departments of the Presidio post and with the forts in the harbor of San Francisco, i. e., Fort Mason, Fort Baker, Alcatraz Island, Angel Island, and Fort Scott. The lines and instruments used in this system belong to the Signal Department of the United States Army.

Long-distance connections are transacted over the official telephone, the general hospital being a regular long-distance station.

The personnel of the telegraph and telephone department consists of two privates of the hospital corps; each of whom works seven and one-half hours per day, relieving each other respectively. At 10 o'clock at night the telegraph department is closed and the guard in charge of the administration building answers the telephone and transacts the business necessary from that time until opening of the office at 7 o'clock in the morning.

The approximate number of Western Union messages sent since the opening of the office November 9, 1900, has been 1,800.

The approximate number of Western Union messages received since the opening of the office November 9, 1900, has been 1,700.

Copies are kept on file of all messages received and sent since the opening of the office. The office has handled the personal business of the inmates and employees of the hospital in addition.

The city official telephone is for the transaction of official business pertaining to the hospital. Daily reports are kept of the switches made and the business transacted, and these reports are inspected daily by the commanding and executive officers.

The approximate number of messages sent over the official telephone for the year ending June 30, 1900, has been 12,000.

VIII. *Printing office.*—In the printing office is done all the printing of forms needed in the administrative work of the hospital. The printing outfit consists of the following: A Gordon press, capable of printing a sheet 12 by 15 inches; a Challenge paper cutter, with a 14-inch blade; a letterpress; and 25 fonts of type, ranging in size from 6 point to 30 point. The press is run by foot power and can not stand high speed. It gives a clear, reliable print, but has to be constantly watched because of worn parts.

During the year five cases of new type have been added, and with the useful cases already on hand the office can properly handle all the regular work of the hospital.

The personnel of the printing office consists of two privates of the hospital corps. A large part of the work consists in printing the forms for the reports and records. Of these there are 98 numbered forms, and a great many which it has been found impracticable to number. The unnumbered forms are such as index cards, bed cards, baggage checks, meal tickets, etc.

The miscellaneous work of the printing office consists of printing labels for books and bottles, general orders, special orders, circulars, programmes, letter heads, addresses on envelopes, signs, notices, and note heads.

During the past month, in which the office did the average amount of work, 43 regular numbered forms were printed, making in round numbers 36,000 blanks. Most of the tabulated blanks required from two to three forms and impressions. In this list is not included the miscellaneous work done in the office during that time.

A very limited amount of printing has been done for places other than the general hospital. In June this office printed two tabulated forms and two straight forms for the school of instruction on Angel Island, two straight forms for the post quartermaster, and two for the muster-out camp.

Work which is completed in the printing office for use in one department of the hospital only is delivered to that department. If it is for general use it is kept in the printing office and issued as needed.

IX. *Hospital corps.*—The hospital corps of the hospital is divided into a permanent and casual detachment. The average number per day of men on duty in both detachments during the fiscal year is given below:

	Daily average strength.	Sick.
Permanent detachment:		
Hospital stewards for duty.....	3.92	0.12
Acting hospital stewards for duty.....	5.26	.20
Privates for duty.....	130.47	5.06
Casual detachment:		
Hospital stewards.....	1.01	1.31
Acting hospital stewards for duty.....	1.25	.09
Privates for duty.....	11.27	18.74

Confinement.

Permanent detachment:	
Hospital stewards.....	0
Acting hospital stewards.....	0
Privates.....	1.50
Casual detachment:	
Hospital stewards.....	0
Acting hospital stewards.....	0
Privates.....	.48

The following rules and regulations concerning the hospital corps have been issued during the year:

"Men desiring to leave the hospital on pass will apply to the steward in charge of the detachment before 9 a. m., and no passes will be approved after that hour unless in case of extreme urgency.

"Men applying for passes are expected to avail themselves of the same, and no one will be permitted to remain around the hospital during the hours named on pass unless it has previously been turned in.

"Upon leaving the hospital each man will possess himself of his pass and upon returning will turn in the same to the door guard, who will note the hour of return on the pass. No one will be permitted to leave the hospital corps quarters by the window in the front of the building, but must pass through the administration building.

"Check passes will be granted as often as the exigencies of the service permit at the discretion of the commanding officer. Passes to extend to or beyond reveille will be granted once a week.

"Men desiring to go on pass during the hours of duty will have the same indorsed by the officer or steward in charge of their work and will be presented for signature of the detachment commander with other passes at the designated hour.

"Men will be permitted to leave the hospital when off duty till 11 p. m. without pass. Members of this detachment will not be permitted to leave the hospital either with or without pass unless they are neatly and cleanly dressed. When in soldiers' clothing, the blue undress uniform will invariably be worn. Shoes must be polished, and the white collar must be worn. Civilian clothing may be worn while on pass, but no mixed uniform will be allowed.

"After 6 p. m. men going on pass will make down their beds before leaving the hospital, and upon returning after 9 p. m. will remove their shoes as soon as they enter the hallway. No loud or boisterous conversation will be allowed in the lavatories or hallways after that hour, and no unnecessary noise will be permitted in or around the squad rooms.

"Anyone failing to comply with these rules will be denied pass privileges for such length of time as the gravity of the case warrants. Repeated failures will entail severer punishment."

X. *Female nurses.*—The work of nursing the sick at this hospital has been entirely performed by female nurses under the charge of a chief nurse. During the year 142 female nurses have reported at this hospital, of whom 90 were transferred to the Philippine Islands, 9 to Fort Bayard, N. Mex., 1 to Fort Sam Houston, Tex., and 42 were discharged from the service.

The number of nurses on duty June 30, 1900, was 40, which number has been retained throughout the year.

MEDICAL WORK OF THE HOSPITAL.

The medical work was attended to practically by contract surgeons, of whom a certain number had been detailed permanently to this hospital. As a rule, 1 medical officer has had charge of two wards of 40 patients each.

Connected with the medical work of the wards there has been in operation an X-ray and bacteriological laboratory and an eye, ear, nose, and throat clinic. The details of the work done in each of these will be found in other portions of this report. The entire medical work of the hospital has been under the charge of a medical superintendent.

A very large percentage of the cases received at this hospital are suffering from diseases of the gastro-intestinal tract, most of them being cases of chronic enteritis or dysentery. The results achieved in the treatment of these cases have been far from discouraging, as will be seen by the low rate of mortality during the period of time since the hospital has been in operation.

The total number of patients admitted to the hospital during the fiscal year was 5,587, divided as follows:

Regulars, 2,813; volunteers, 2,278; discharged soldiers, 496.

The patients in this hospital have been derived from the following sources: Transports from the Philippine Islands, admissions from the model camp, Presidio, San Francisco, Cal., admissions from civil life in the case of discharged soldiers, and readmissions from various sources.

The number of patients received from transports has been 3,513.

The following is a tabulated statement of the transports which have brought patients to this hospital, with the date of arrival and the number of Regulars and Volunteers which were entered in the hospital as patients:

Transport.	Date of arrival.	Regulars.	Volunteers.	Total.
Hancock.....	July 14, 1900	104	163	267
Warren.....	July 28, 1900	27	18	45
Logan.....	Aug. 6, 1900	61	0	61
Sherman.....	Aug. 7, 1900	58	65	123
Thomas.....	Aug. 30, 1900	154	116	270
Grant.....	Sept. 23, 1900	141	87	228
Sherman.....	Oct. 19, 1900	209	137	346
Meade.....	Oct. 31, 1900	112	85	197
Logan.....	Nov. 16, 1900	127	65	192
Thomas.....	Dec. 2, 1900	138	62	200
Hancock.....	Dec. 11, 1900	116	49	165
Grant.....	Dec. 31, 1900	107	65	172
Sherman.....	Jan. 7, 1901	110	84	194
Warren.....	Feb. 3, 1901	59	105	164
Sheridan.....	Feb. 6, 1901	63	66	129
Indiana.....	Feb. 27, 1901	106	77	183

Transport.	Date of arrival.	Regulars.	Volunteers.	Total.
Meade	Mar. 1, 1901	24	29	53
Hancock	Mar. 12, 1901	0	18	18
Buford	Mar. 13, 1901	0	5	5
Kilpatrick	Mar. 17, 1901	177	43	220
Logan	Mar. 29, 1901	0	20	20
Thomas	Apr. 15, 1901	2	30	32
Rosecrans	Apr. 18, 1901	3	0	3
Grant	Apr. 19, 1901	91	48	139
Garonne	Apr. 20, 1901	0	9	9
Sheridan	May 18, 1901	3	40	43
Hancock	June 2, 1901	0	7	7
Pennsylvania	June 18, 1901	0	6	6
Ohio	June 21, 1901	0	9	9
Grant	June 25, 1901	0	16	16
Logan .....	.....do.....	0	33	33
Thomas	June 26, 1901	0	33	33
Buford	June 27, 1901	0	21	21
Kilpatrick	June 28, 1901	0	20	20
Total		1, 992	1, 521	3, 513

During the year there have been 182 deaths, divided as follows: Regulars, 74; Volunteers, 96; discharged soldiers, 12. The cause of death in each case will be found in the report of the pathologist of the hospital.

During the year 116 patients were transferred to Fort Bayard, N. Mex., to receive treatment for pulmonary tuberculosis. These cases were divided as follows: Regulars, 81; Volunteers, 35.

One hundred and seventy-three patients were transferred to Hot Springs, Ark., (Army and Navy General Hospital) for treatment. These cases were divided as follows: Regulars, 152; Volunteers, 21.

NOSOLOGICAL INDEX OF DISEASES TREATED IN THE UNITED STATES ARMY GENERAL HOSPITAL, PRESIDIO, SAN FRANCISCO, CAL., SINCE JULY 1, 1899, TO THE END OF THE FISCAL YEAR JUNE 30, 1901.

The following nosological index has been compiled with a great deal of care from the records of the hospital. While it can not be said to be complete in every instance, it gives a general idea of the number and character of the cases which have been admitted to this hospital. It will be noticed that the total number of cases classified in this index does not equal the total number admitted to the hospital, but this is explained by the fact that the diagnoses in many of the cases admitted have been of uncertain character and have not been included in the index, although they might be included under the vague head of "undetermined diagnoses."

The index is arranged according to the divisions given in the Medical Manual:

I.—*Infectious diseases, general and local.*

Diseases.	Regulars.	Volunteers.	Total.
Scarlet fever	1	1	2
Measles	162	54	216
Variola	4	22	26
Vaccinia	36	40	76
Varicella	0	1	1
Influenza	22	1	23
Malarial fever, pernicious	2	1	3
Malarial cachexia	127	117	244
Erysipelas	4	4	8
Septicemia	1	1	2
Mumps	63	28	91
Diphtheria	8	12	20
Typhoid fever	76	131	207
Cerebro-spinal meningitis	2	0	2
Rheumatic fever	16	8	24
Malarial fever:			
Intermittent	329	314	643
Remittent or continued	51	92	143
Tuberculosis of lungs	124	99	223
Tuberculosis of other organs	5	2	7
Carcinoma	8	1	9
Sarcoma	1	0	1
Syphilis	75	42	117
Gonorrhea	69	72	141
Gonorrheal epididymitis and orchitis	46	48	94
Chancroid	133	118	251
Other diseases of this class	15	26	41
Total	1, 380	1, 235	2, 615

II.—*Diseases of nutrition, general.*

Disease.	Regular.	Volunteers.	Total.
Anemia	34	19	53
Glycosuria	1	1	2
Total	35	20	55

III.—*Structural and functional diseases.*

A.—DISEASES OF THE NERVOUS SYSTEM.

Disease.	Regular.	Volunteers.	Total.
Alcoholism:			
Acute	5	19	24
Chronic	2	14	16
Delirium tremens	3	2	5
Chorea	3	1	4
Epilepsy	20	16	36
Insanity	135	80	215
Locomotor ataxia	1	1	2
Meningitis	2	3	5
Myelitis	4	1	5
Neuritis	7	11	18
Neuralgia	15	3	18
Neurasthenia	17	6	23
Nostalgia	2	1	3
Paralysis	30	26	56
Other diseases of this class	12	7	19
Total	258	191	449

B.—DISEASES OF THE DIGESTIVE SYSTEM.

Corrosive and irritant poisons, effects of	1	0	1
Tonsillitis	79	49	128
Peritonitis, acute	0	4	4
Dyspepsia	24	10	34
Gastritis	129	123	252
Colic	4	0	4
Constipation	38	14	52
Tenia	2	7	9
Diarrhea:			
Acute	30	81	111
Chronic	153	183	336
Enteritis	94	96	190
Appendicitis	38	23	61
Dysentery:			
Acute	1	5	6
Chronic	813	815	1,628
Hemorrhage, intestinal	1	1	2
Fistula in ano	15	18	33
Hemorrhoids	57	71	128
Biliary colic and calculi	1	1	2
Jaundice, catarrhal	2	9	11
Hepatitis	3	1	4
Other diseases of this class	30	38	68
Total	1,615	1,549	3,064

C.—DISEASES OF THE CIRCULATORY SYSTEM.

Angina pectoris	4	0	4
Cardiac irritability	6	5	11
Pericarditis	4	5	9
Endocarditis	11	5	16
Valvular disease and results	50	15	65
Embolism	1	0	1
Aneurism	5	0	5
Varicose veins	9	11	20
Phlebitis	5	4	9
Other diseases of this class	11	2	13
Total	106	47	153

III.—*Structural and functional diseases*—Continued.

D.—DISEASES OF THE RESPIRATORY ORGANS.

Diseases.	Regulars.	Volunteers.	Total.
Pharynx, disease of	19	14	33
Larynx, disease of	16	9	25
Coryza	15	11	26
Bronchitis:			
Acute	110	49	159
Chronic	50	47	97
Capillary	1	0	1
Asthma	21	14	35
Pulmonary hemorrhage	1	0	1
Pneumonia:			
Catarrhal	5	10	15
Croupous	80	40	120
Pleurisy	53	25	78
Other diseases of this class	11	4	15
Total	382	223	606

E.—DISEASES OF THE GENITO-URINARY SYSTEM.

Pyelitis	1	0	1
Nephritis:			
Acute parenchymatous	21	9	30
Chronic parenchymatous	15	15	30
Cystitis	18	8	26
Enuresis	1	0	1
Hematuria	2	0	2
Prostatitis	0	2	2
Urethral stricture	11	2	13
Paraphimosis	2	2	4
Phimosis	4	22	26
Varicocele	40	38	78
Hydrocele	2	7	9
Other diseases of this class	26	15	41
Total	143	120	263

F.—DISEASES OF THE LYMPHATIC SYSTEM AND DUCTLESS GLANDS.

Adenitis	2	14	16
Lymphangitis	2	1	3
Other diseases of this class	1	2	3
Total	5	17	22

G.—DISEASES OF THE MUSCLES, BONES, AND JOINTS.

Muscular rheumatism and myalgia	96	49	145
Whitlow	1	1	2
Osteitis	2	1	3
Periostitis	5	2	7
Arthritis:			
Chronic rheumatic	14	4	18
Bunion	14	14	28
Synovitis	1	0	1
Other diseases of this class	6	13	19
Total	27	23	50
Total	166	107	273

H.—DISEASES OF THE INTEGUMENT AND SUBCUTANEOUS CONNECTIVE TISSUE.

Corns and warts	0	5	5
Ingrowing nails	19	7	26
Abscess	35	32	67
Furuncle	5	16	21
Carbuncle	0	1	1
Ulcer	20	34	54
Dermatitis from poisonous plants	3	9	12
Herpes	3	3	6
Eczema and pemphigus	6	8	14
Impetigo	1	1	2
Scabies	1	1	2
Other diseases of this class	1	0	1
Total	94	111	211

III.—*Structural and functional diseases*—Continued.1.—DISEASES OF THE ORGANS OF SPECIAL SENSE.¹

Disease.	Regulars.	Volunteers.	Total.
DISEASES OF THE EYE.			
Lids, diseases of	0	2	2
Conjunctivitis:			
Acute	10	14	24
Chronic	3	2	5
Corneitis	0	2	2
Scleritis	4	0	4
Iritis	6	6	12
Retinitis	3	6	9
Asthenopia	1	0	1
Trachoma	2	1	3
Corneal ulcer	0	1	1
Opacities of the vitreous	0	1	1
Cataract	2	2	4
Optic neuritis	1	0	1
Corneal opacities	5	1	6
Total	37	41	78
DISEASES OF THE EAR.			
Diseases of the external ear	15	66	81
Diseases of the tympanum	1	1	2
Otitis media, suppurative	45	58	103
Deafness	2	4	6
Total	63	129	192
DISEASES OF THE NOSE.			
Nasal catarrh, chronic	3	0	3
Rhinitis	3	4	7
Total	6	4	10

¹The nosological index of diseases of the eye, ear, nose, and throat include only those to January 1, 1901. The index of these diseases which have occurred since January 1, 1901, will be found in the portion of this report upon the work done in the eye, ear, nose, and throat clinic.

IV.—*Accidents and injuries.*

A.—GENERAL INJURIES.

Disease.	Regulars.	Volunteers.	Total.
Burns and scalds	3	3	6
Exhaustion from disease	4	15	19
Insolation	23	15	38
Total	30	33	63

B.—INJURIES TO SPECIAL PARTS.

Contusions and sprains	37	26	63
Fractures	28	30	58
Hernia:			
Inguinal	80	60	140
Other	14	11	25
Orchitis, from injury	7	5	12
Wounds:			
Contused	8	7	15
Incised	11	8	19
Lacerated	17	9	26
Punctured	0	3	3
Gunshot	189	321	510
Other local injuries	6	2	8
Total	397	492	879

V.—Unclassified.

Disease or injury.	Regulars.	Volunteers.	Total.
Unknown	9	5	14
Convalescent.....	157	108	265
Total	166	113	279

From the consideration of the nosological index it will be seen that the diseases of the gastro-intestinal tract have furnished a very large percentage of the total number of patients admitted to the hospital. Next in frequency to those diseases come the malarial fevers, while the venereal diseases follow the malarial fevers in order of frequency.

Considered in the divisions as given in the Medical Manual, diseases of the digestive system stand first in order of frequency; infectious diseases, second; accidents and injuries, third; diseases of the respiratory organs, fourth; diseases of the nervous system, fifth; diseases of the muscles, bones, and joints, sixth; diseases of the genito-urinary system, seventh; diseases of the integument and subcutaneous connective tissue, eighth; diseases of the circulatory system, ninth; diseases of the ear, tenth; diseases of the eye, eleventh; diseases of general nutrition, twelfth; diseases of the nose, thirteenth.

Rate of mortality.—The total number of cases autopsied at this hospital since July 1, 1899, has been 252. The following table, compiled from 246 autopsy records, gives a good general idea of the rate of mortality of this hospital from the diseases mentioned. The deaths numbered under the diseases selected include all deaths from those diseases:

Cause of death.	Number of cases in hospital.	Number of deaths.	Mortality. Per cent.
Chronic dysentery, follicular, pseudo-diphtheritic, gangrenous, and amœbic	1,634	113	6.9
Chronic enteritis.....	637	12	1.9
Pulmonary tuberculosis.....	223	40	18
Lobar pneumonia.....	120	24	20
Broncho-pneumonia.....	16	9	60
General miliary tuberculosis.....	5	5	100
Acute septicæmia.....	4	4	100
Empyema.....	40	4	10
Acute nephritis.....	30	5	16.64
Pernicious anemia.....	5	5	100
Acute peritonitis.....	4	2	50
Acute meningitis.....	5	3	60
Chronic nephritis.....	30	3	10
Typhoid fever.....	207	4	1.9
Valvular disease of heart.....	65	4	6.15
Carcinoma.....	2	2	100
Pernicious malarial fever.....	3	2	66.66
Cerebral apoplexy.....	1	1	100
Cirrhosis of liver.....	1	1	100
Alcoholism.....	40	1	2.5
Fracture of skull.....	1	1	100
Primary tuberculosis of kidney.....	1	1	100

The consideration of this table shows several points of interest. The mortality rate of chronic dysentery, including all forms, has been low, despite the fact that many of these cases—in fact, the majority—came to the hospital very much debilitated from repeated attacks of dysentery, and in a large number of instances so weak and emaciated that no hopes were entertained of their recovery. The treatment of chronic dysentery at this hospital has varied considerably. In the amœbic cases, which have shown a very high percentage of recovery here, the treatment habitually used has been quinine injections. It has been found that under this form of treatment the amœbæ quickly disappeared from the stools in most instances, as well as blood and mucus, and recovery took place more or less rapidly. In a few instances quinine injections seemed to do no good, the amœbæ persisting, and most of these cases finally resulted in death. In the forms of dysentery other than amœbic the treatment by sulphate of sodium or magnesium sulphate has been used in the more

acute cases with much success, and often in the chronic cases the treatment by magnesium sulphate has resulted in many cures. Injections of nitrate of silver have been used rather extensively and in many instances with good results. One of the greatest objections, however, to this method of treatment is the intense pain which the injections cause, and which, in some instances, has been so severe as to preclude their use. Bismuth subnitrate and opium have not been used to any great extent at this hospital in the treatment of dysentery.

One of the most difficult things in the treatment of cases of this kind is the diet. Some cases seem to be unable to take or absorb nourishment in any form. Quite a number of the recent albuminoid preparations have been tried, and in some instances have seemed to benefit the patient; but, as a rule, it has been found that peptonized milk acts fully as well as any of the proprietary preparations. In certain cases such preparations as "Tropon" and "Plasmon" have benefited patients who were unable to retain or absorb any other article of food; but these cases were rare and did not differ clinically from other cases which retained the ordinary articles of liquid diet. These preparations are undoubtedly useful in selected cases, but the majority of the patients to whom they were given expressed more or less dissatisfaction with them on account of their taste and mode of preparation and were better satisfied with the ordinary liquid diets. It is safe to say that the ideal diet for cases of chronic enteritis and dysentery is yet to be discovered.

Broncho-pneumonia.—The mortality was 60 per cent in broncho-pneumonia. It appears rather high, but if the class of cases in which this disease occurred be considered it will not be found to be so. All of the cases of broncho-pneumonia which have entered this hospital have followed measles, and it is a well-known fact that in such cases the mortality in adults is excessive. Nearly all of the cases developed after the infection of measles had apparently disappeared and were probably due to exposure brought about by the carelessness of the patient.

Lobar pneumonia.—Lobar pneumonia has shown a mortality of 20 per cent at this hospital. This is a very low mortality rate when the number of cases is considered in which an alcoholic history was obtained. Nearly 30 per cent of the cases which have occurred here gave a history of a prolonged alcoholic debauch just before the onset of the pneumonia, and about 40 per cent more gave a history of excessive use of alcohol at various periods of time, ranging from three months to a year or more. Most of the cases occurred in young men of very robust constitution, many of them being, if anything, overweight. In such cases where both the alcoholic history and the physical condition of the patient is against recovery, a very high mortality rate is to be expected. A mortality rate of 20 per cent at this hospital should therefore be considered remarkably low, considering the character of the cases, as in private practice, where the conditions are most favorable, the mortality rate of lobar pneumonia is generally estimated at 15 per cent and in hospital practice 25 per cent.

Pulmonary tuberculosis.—The mortality rate of pulmonary tuberculosis has been 18 per cent. This mortality rate, however, does not amount to very much, as most of the cases of pulmonary tuberculosis which could travel were sent almost immediately to Fort Bayard, N. Mex., for treatment, and only those who were unable to leave their beds have been retained in this hospital. It would be impossible to give a correct mortality in the cases of pulmonary tuberculosis which passed through this hospital without a knowledge of the history of the cases at Fort Bayard.

Pernicious malarial fever.—The mortality rate of 66.66 per cent in cases of pernicious malarial fever is rather high, but as only three cases have occurred at this hospital, and two of them were very obscure as regards to their symptomatology, it is hardly a fair estimate of the mortality rate in this disease, as, without doubt, had the cases been recognized sooner, the result might have been different.

As would have been expected, the mortality rate in miliary tuberculosis, acute septicæmia, pernicious anemia, carcinoma, and cerebral apoplexy has been 100 per cent.

Empyema.—The mortality rate in empyema at this hospital has been 10 per cent. Nearly all the cases occurred as a sequela of pneumonia. Cultures made from the exudate in the fatal cases have shown as a rule streptococci and staphylococci. One of the four fatal cases gave a culture of the diplococcus pneumoniae of Sternberg.

Acute nephritis.—The mortality rate in acute nephritis has been 16.66 per cent, which is rather high, but it should be remembered that in almost every case which has died from this disease, it has occurred as a complication of prolonged enteritis or dysentery. The patients, therefore, were very much depleted as regards their general condition and could not resist the inflammation of the kidneys. In almost every case dying of acute nephritis, it was found at autopsy that there had been a previous

severe inflammation of some portion of the intestinal tract, most often of the ileum and a portion of the large intestine.

Typhoid fever.—The mortality rate of typhoid fever has been exceedingly low, being only 1.9 per cent. From a comparison of the mortality rates of this disease in various large hospitals throughout the country, it is believed that this is the lowest mortality rate, considering the large number of cases, which has ever been recorded. The treatment prescribed was that of cold baths and liquid diet, with an addition in some cases of intestinal antiseptics, such as salol and calomel. Treatment has differed in no way from that ordinarily prescribed at most of the large hospitals in this country, and it is probably true that careful nursing and the strong constitution of most of the patients contributed more to the successful results than the medical treatment.

Primary tuberculosis of the kidneys.—During the year one case has occurred of this very rare disease and this case proved fatal before any portion of the body was invaded by the infection. While tuberculosis of the kidney associated with tuberculosis of other organs, and secondary to infection in other organs, is of a very common occurrence, the primary involvement of the kidney and death following from that involvement before the infection has spread, is very rare. In this case both kidneys contained numerous tubercular abscesses and tubercles. The urine, before death, showed the presence of tubercle bacilli and of pus and blood. The patient had never presented any symptoms of tuberculosis of other organs and complained simply of some pain over the lumbar region, and of passing blood-stained urine. He died shortly after entering the hospital, from uremic poisoning. At autopsy the condition briefly described above was found in the kidneys, but no other organ in the body showed any trace of tubercular infection.

Certificates of disability.—An important function of the hospital has been the discharge of disabled soldiers on surgeon's certificate of disability. In the execution of the work, much of which was done at a time when there was urgent necessity for making room for incoming patients, great care has been taken to guard against the discharge of soldiers whose condition was such as to encourage the belief that they might be of future usefulness to the service, and in the case of volunteers that they might ultimately recover without permanent disability. The method was as follows:

The ward officers, after sufficient observation of the cases, made such recommendations respecting the disposition of the same as they thought indicated, upon a form for the purpose. A soldier recommended for such discharge was referred to a regular medical officer of experience, whose duty it was to carefully examine and observe him, and when satisfied that the disability was permanent, to have prepared under his supervision the necessary certificates, which were sent to the commanding officer for his action.

The frequent lack of notation in the descriptive list or other official papers of the manner of incurrence of the wound, injury, or disease that resulted in the disability, has been an annoying obstacle in the way of thoroughly satisfactory preparation of these certificates. In such cases, when impracticable to obtain the desired information from noninterested parties, it has often been necessary to rely on the sworn statement of the soldier himself.

During the fiscal year 951 soldiers were discharged on surgeon's certificate of disability. From the statement below, giving the number of discharges by months, it will be seen that the certificates of a large part of the 951 were made when transports were arriving at close intervals, bringing sick in large numbers, thus taxing to the utmost the capacity of the hospital and the energy of its personnel.

Month.	Regulars.	Volunteers.	Total.
July	31	24	55
August	34	55	89
September	36	56	92
October	93	35	128
November	78	41	119
December	80	26	106
January	64	30	94
February	35	45	80
March	30	43	73
April	34	18	52
May	27	4	31
June	18	14	32
Total	560	391	951

The following tabulated statement arranged according to the Medical Manual, shows the cases of the nature of disability from July 1, 1900, to June 30, 1901:

Infective diseases:	
Malaria (fever)	14
Pulmonary tuberculosis	20
Typhoid fever	4
Typhoid dysentery	1
Syphilitic lesions and abscess	4
Total	43
Diseases of the nervous system:	
Chorea	3
Neurasthenia	3
Epilepsy	15
Loss of memory	1
Neuritis, alcoholic	2
Osteomyelitis	1
Locomotor ataxia	1
Paralysis, local and general	27
Neuritis	8
Morphine habit	2
Spinal sclerosis	2
Epileptiform convulsions	1
Tales dorsalis	1
Cephalalgia	21
Melancholia	1
Total	89
Diseases of the digestive system:	
Chronic dysentery	31
Caries of teeth	37
Stricture of rectum	1
Deranged nutrition	4
Gastric dilatation	1
Gastro-enteritis	12
Chronic diarrhea	15
Chronic gastritis	1
Chronic dyspepsia	1
Enterocolitis	1
Disease of the liver	2
Chronic gastric ulcer	1
Chronic peritonitis	1
Hemorrhoids	2
Total	110
Circulatory system:	
Aortic insufficiency	6
Myocarditis	1
Phlebitis	9
Cardiac, valvular disease	21
Exophthalmic goiter	4
Tachycardiac arrhythmia	18
Endocarditis	5
Varicocele	2
Varicose veins	3
Total	69
Respiratory organs:	
Asthma	14
Dyspnoea	3
Chronic pleurisy	5
Lung consolidation	2
Chronic laryngitis	1
Nasal catarrh	1
Total	26

Gunshot wounds and effects.....	248
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Injuries:	
Hands and arms.....	10
Ventral hernia.....	10
Inguinal hernia, refusing operation.....	44
Heat exhaustion.....	1
Flat foot.....	12
Knife wounds.....	15
Cataract.....	1
Periostitis.....	1
Chronic synovitis.....	7
Subluxation.....	4
Injury, feet.....	4
Fracture.....	39
Kyphosis.....	3
Necrosis.....	2
Ankylosis.....	4
Total.....	157
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Diseases of the eye and ear:	
Defective vision.....	58
Otitis media.....	104
Total.....	162
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Disease of the muscles, bones, and joints:	
Rheumatism.....	18
Psoas abscess.....	1
Local asphyxia.....	1
General muscular tremor and atrophy.....	2
Contraction palmar fascia, hand.....	1
Total.....	23
<hr/>	
Genito-urinary organs:	
Nephritis.....	6
Cystitis.....	2
Hydrocele.....	1
Urethral fistula.....	1
Total.....	10
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Miscellaneous:	
Hammer toe deformity.....	2
Abdominal tumor.....	1
Bunions of feet.....	6
Abdominal aneurism.....	1
Rectal prolapsus.....	1
Ischio-rectal abscess.....	1
Diabetes mellitus.....	1
Total.....	13

The following circulars regarding surgeon's certificates of disability have been published during the year:

"Hereafter, including to-day, each medical officer at this hospital having charge of wards will submit to the executive officer on or before 2 o'clock p. m. two sets of certificates of disability, commencing with the permanently disabled volunteers and such disabilities as are absolutely palpable, such as hernia, perforation of the drum, structural changes of the eye, or wounds.

"Whenever a medical officer finds his material for certificates exhausted he will, in place of certificates, submit a report to that effect to the executive officer in order that the commanding officer may make personal inspection with a view of possible detection of further cases suitable for discharge."

"The following instructions relative to the preparation of surgeons' certificates in cases of disability are necessitated, viz:

"1. The surgeons should carefully read the instructions on the blanks and comply with them.

"2. The first part should give the reason why a soldier is incapable of performing the duties of a soldier, and not a clinical history.

"3. An 'opinion' as to 'cause' of disability is required. This does not mean legal evidence, but an opinion formed from questioning the patient and weighing the value of his answers by other information obtainable, in the same manner as an opinion would be given in life insurance or accident policy.

"4. The question of whether incurred in line of duty is often difficult to answer.

"As a general rule it must be assumed that any disability was incurred in line of duty, unless it is clearly established that it existed prior to enlistment and was not discovered at that time, or was the result of the soldier's own unlawful act. Even then an aggravation due to the service resulting in disability would entitle the soldier to a certificate of 'In line of duty.'

"A disability contracted when on temporary absence, such as a pass, would be in line of duty, while if contracted on leave or furlough is not in line of duty.

"Careful attention should be paid to the degree of disability, and liberality may be exercised, as the degree in case of pension is fixed by the pension boards, and the opinion of the surgeon is not final.

"6. The certificates must be in the surgeon's own handwriting and should be written as legibly as possible."

EYE, EAR, NOSE, AND THROAT CLINIC.

On account of the large number of soldiers who present diseases of the eye, ear, nose, and throat, it has been necessary to establish a clinic in the hospital for the treatment of these diseases.

The work done in this clinic during the fiscal year is given below.

The total number of cases examined in the clinic during the six months since January 1, 1901, has been 501, divided as follows:

Regulars	264
Volunteers	214
Discharged soldiers	4
Civilians	19

Total	501
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Total number of diseases of the eye	246
Total number of diseases of the ear	149
Total number of diseases of the nose and throat	132

Total diseases of all kinds	527
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It will be noticed that the total number of these slightly exceeds that of the total number of cases examined, but this is explained by the fact that some cases present disease of more than one organ and have been counted in the list more than once.

DISEASES OF THE EYE.

The following is a nosological table of diseases of the eye which have been treated in the clinic since January 1, 1901:

Myopia	13
Hypermetropia	9
Compound myopic astigmatism	11
Compound hypermetropic astigmatism	6
Anisometropia	3
Convergent strabismus	3
Conjunctivitis:	
Simple	49
Membranaceous	2
Gonorrheal	2
Granular—	
Acute	4
Chronic	13
Chemosis of conjunctiva	2

Chalazion.....	5
Blepharitis ciliaris.....	7
Ulcerative keratitis.....	2
Corneal opacities.....	16
Kerato-scleritis.....	2
Pterygium.....	9
Cataract:	
Traumatic.....	1
Senile.....	1
Incipient.....	1
Iritis:	
Rheumatic.....	2
Syphilitic.....	7
Sequel to variola.....	1
Vitreous opacities.....	2
Hemorrhage into the vitreous.....	1
Retinitis:	
Simplex.....	1
Proliferating.....	1
Pigmentosa.....	2
Hemorrhage into retina.....	1
Choroido retinitis.....	4
Choroiditis.....	7
Oedema of retina.....	1
Atrophy of optic nerve.....	5
Cellulitis, orbital.....	2
Dacryo-cystitis:	
Acute.....	2
Chronic.....	2
Stenosis nasal duct.....	1
Supraorbital neuralgia.....	2
Paralysis of ocular muscles.....	1
Abcess external canthus (from sting of insect).....	1
Enucleation of eyeball.....	3
Malingering (vision).....	36
Total.....	246

DISEASES OF THE EAR.

The following is a nosological table of diseases of the ear treated in the clinic since January 1, 1901:

Eczema external auditory canal.....	1
Furuncles external auditory canal.....	3
Impacted cerumen.....	10
Mastoiditis.....	3
Myringitis, acute.....	1
Tubal catarrh:	
Acute.....	5
Chronic.....	17
Otitis media:	
Nonsuppurativa, acuta.....	7
Suppurativa, acuta.....	22
Nonsuppurativa, chronica.....	15
Suppurativa, chronica.....	59
Malingering (hearing).....	6
Total.....	149

DISEASES OF THE NOSE AND THROAT.

The following is a nosological table of diseases of the nose and throat treated in the clinic since January 1, 1901:

Eczema, nose.....	1
Deflection nasal septum.....	5
Nasal hemorrhage.....	2
Nasal polypus (sessile).....	1

Rhinitis:	
Acute	10
Chronic hypertrophic	5
Syphilitic necrosis septum	2
Tonsillitis:	
Acute parenchymatous	3
Acute croupous	2
Follicular	2
Hypertrophy tonsils	7
Pharyngitis:	
Acute catarrhal	4
Chronic catarrhal	13
Syphilitic ulceration pharynx	1
Naso-pharyngitis:	
Acute	19
Chronic	33
Adenoids, pharyngeal vault	2
Laryngitis:	
Acute catarrhal	15
Tubercular	2
Syphilitic	1
Papilloma vocal chord	1
Paralysis vocal chord	1
Total	132

ETIOLOGY OF DISEASES OF EYE, EAR, NOSE, AND THROAT.

It is very difficult in most of these cases to state positively their etiology, on account of the imperfect histories given by the patients and that it can not be stated with certainty whether or not many of them were contracted prior to enlistment. In a few, however, it is possible to make a more decided statement in regard to the etiology.

Diseases of the eye.—The corneal opacities were in most instances due to gonorrheal conjunctivitis. Most cases of conjunctivitis and pterygium are undoubtedly due to the intense glare of the tropical sun. This factor also caused most of the cases of choroiditis and choroidoretinitis.

In cases giving a history of pernicious malarial fever, ophthalmoscopic examination has revealed deposits of pigment in the retina. In some instances the particles are so fine as not to interfere with the vision. In others the pigment is deposited in larger amount, resulting in diminished vision of 50 to 60 per cent.

The majority of cases of iritis were directly traceable to syphilitic infections. Most of these infections were contracted either in San Francisco, Honolulu, or Nagasaki; very few cases originating in the Philippines. The same can not be said, however, of the infections due to gonorrhea.

Malingering.—Among a certain class of soldiers the claiming of disability due to diseases of the eye or defect in vision is common. Many of these men realize how difficult it is without the proper facilities for intraocular examinations to detect the malingering. This is also true of claims for defect of vision, for without the use of test lenses and the ophthalmometer, it is often impossible to positively state whether there is a defect of vision or not, and even with these aids it often requires repeated examinations to detect the malingerer. The complete equipment of the eye clinic at this hospital has been of the utmost value in detecting malingering.

Disease of the ear.—Eczema and furunculosis of the external auditory canal are due, in a large proportion of the cases, to bathing in the filthy streams of the Philippines, which are laden with organic matter and human excrement. This is deposited in the external auditory canal and becomes decomposed owing to the heat and moisture of the climate and the unsanitary habits of the soldiers, giving rise to eczema and formation of furuncles.

Mastoiditis is due to the extension of the middle ear disease, a great many cases recovering without operation. The nonsuppurative form of otitis media has been found to be often due to the excessive use of quinine in cases suffering from malarial infection. The suppurative form of otitis media was almost invariably found to be a sequel of typhoid fever, measles, or variola.

Disease of the nose and throat.—The etiology of these diseases does not differ from the same diseases occurring in any other class of patients.

The prognosis and treatment of disease of the eye, ear, nose, and throat does not differ in the army from the same class of cases occurring in civilian life, save in unimportant particulars.

BACTERIOLOGICAL LABORATORY.

The report of the bacteriological laboratory, prepared by the pathologist of the hospital, is here inserted. During the year the blood and urine of every case entering the hospital has been examined, and in addition the feces of every case diagnosed as chronic dysentery and the sputum of every case in which any lung symptoms were present. The following orders and circulars concerning the work of the laboratory have been issued during the year:

"All cases entering this hospital with a diagnosis of malarial fever, malarial cachexia, or in which malarial infection is suspected, should not have the blood examined until at least a week has elapsed after entry, unless active symptoms are present before that time. Quinine should not be administered to any such case until the blood has been examined and the diagnosis confirmed by the pathologist, except in pernicious cases, or where, for some complication, quinine is necessary."

"In cases of suspected tuberculosis, in which, even after repeated examination of the sputa, no tubercle bacilli are demonstrated, the ward officer should recommend transfer to Fort Bayard, provided the physical signs are sufficient to warrant the diagnosis."

"Cases with a diagnosis of malarial fever, in which the parasite is found in the blood, should be treated with quinine until all active symptoms have disappeared. Quinine should then be discontinued and nuclein given. An examination of the blood of all cases upon nuclein should be requested by the pathologist once a week, as long as this remedy is being administered. This is not imperative, and will only be complied with when there may be no detriment resulting from it for the patient."

"Circular No. 5 is modified to read that blood examination of new patients should first be made on bed cases, and in these cases repeated once a week, or oftener if necessary."

"The attention of the medical officers at this hospital is called to the large number of patients whose blood examination shows malarial parasites, but in which no clinical signs are present. Since August 20 there have been 15 such cases. As it is hardly probable that in so large a number there has been no rise of temperature during the twenty-four hours, it is recommended that when possible the temperature of all patients giving a history of malarial infection be recorded every twenty-four hours, as in the malarial fevers of tropical origin the morning and evening temperature can not be relied upon."

"The attention of medical officers of this hospital is called to circular No. 5, section 4, dated February 7, 1900. This paragraph is amended to read as follows:

Examination of feces.—The feces of every case suffering from chronic dysentery or diarrhea, and having more than two bowel movements a day, will be submitted to the pathologist for examination at least once, and as often thereafter as he or the medical officer may direct. This examination is for the purpose of determining whether or no the amoeba coli is present, and, if so, that the proper treatment by quinine enemas be at once instituted."

"In case of death at this hospital the clerk in the officer of the day's room is to send a written notification to the pathologist as soon as possible."

"The card furnished to the pathologist should be filled out in every particular and attached to the body before it is sent to the morgue."

REPORT OF THE BACTERIOLOGICAL LABORATORY, UNITED STATES ARMY GENERAL HOSPITAL, PRESIDIO, SAN FRANCISCO, CAL., FOR THE FISCAL YEAR ENDING JUNE 30, 1901, BY CONTRACT SURG. CHARLES F. CRAIG, UNITED STATES ARMY, DIRECTOR OF THE LABORATORY.

I have the honor to submit the following report of the work done in the bacteriological laboratory of this hospital for the fiscal year ending June 30, 1901:

The total number of examinations made in the laboratory has been 15,260, which were divided as follows:

A. Examinations of blood	5,815
B. Examinations of urine	5,935
C. Examinations of sputa	1,251
D. Examinations of feces	1,116
E. Examinations of post-mortem material	798
F. Miscellaneous examinations	345

Total examinations	15,260
G. Autopsies	163

(A) EXAMINATIONS OF BLOOD.

Five thousand eight hundred and fifteen specimens of blood were examined for the parasites of malarial fever, of which 643 were positive and 5,172 were negative. It will be noted that there is a very large negative result, which is due to the fact that every patient received in this hospital has an examination of the blood made, whether clinical symptoms of malaria are present or not. This practice has been of the utmost value, as by it over 150 cases of malaria were discovered which presented no symptoms of the disease at the time the blood was examined, but in which malarial parasites were found.

The 643 positive cases may be divided as to their etiology as follows:

Cases due to the benign tertian parasite.....	220
Cases due to the quartan parasite.....	3
Cases due to the estivo-autumnal parasites.....	400
Cases due to the tertian estivo-autumnal parasite.....	20

Tertian infections.—Two hundred and twenty specimens of blood contained the tertian parasite, of which 140 were single infections and 80 were double infections. There was nothing remarkable noticed about the tertian malarial parasite in soldiers returning from the Philippine Islands. As a rule, however, the infections were much more resistant than is the case in similar infections in this country. Many of these cases suffered relapses while in the hospital, although quinine was administered very conscientiously.

Quartan infections.—There were only three quartan infections found during the year, which agrees well with the known rarity of the quartan type of malarial infection.

Estivo-autumnal infections.—Four hundred specimens of blood showed the presence of the estivo-autumnal parasite. Of these 327 were due to the tertian estivo-autumnal parasite and 64 to the quotidian estivo-autumnal parasite. Nine cases were combined infections.

In the study of these parasites I have paid especial attention to the division between the tertian and quotidian forms, and careful study has only increased my conviction that two forms of the estivo-autumnal parasite exist, and can be differentiated both microscopically and clinically. This has not been the experience of most American observers, although the Italian schools have accepted these two divisions. As the morphological differences in the two parasites are not easily distinguished without some guide to their study, I shall here note briefly the structure of each and the diagnostic features of interest.

The quotidian estivo-autumnal parasite.—This form of malarial parasite completes its development in twenty-four hours as a rule. The parasite appears first as a very minute ring-shaped or round hyaline body, actively ameboid, within the red blood corpuscle. The outline of the organism is very indistinct, and were it not for its active ameboid movement it would be very easily overlooked. The ring form is usually perfectly circular when at rest, the center appearing of the same color as the corpuscle within which it lies. The organism is not very refractive and its outline is not sharply cut. When in motion it often appears triangular in shape, the movement consisting of a rapid waving motion of its border and the shooting out of minute protoplasmic prolongations, which are retracted almost as quickly as thrown out. The motion is not sluggish, but very rapid. Sometimes the ring form is lost, the organism becoming a pale hyaline disk. The movement is very erratic, and there are long periods of repose during which the ring form is retained. The organism is very small and never grows to occupy more than one-sixth of the corpuscle. The corpuscle containing the parasite is smaller than those surrounding it; presents a shrunken, wrinkled appearance, and is dark green in color. Often two or more parasites are seen within one corpuscle. There is no signet-ring appearance so common in the malignant tertian parasite. It is in this form of estivo-autumnal fever that the red corpuscles are most rapidly destroyed, and in pernicious cases almost every corpuscle in a microscopic field will be seen to contain a parasite. While the ameboid movement is not as constant as in the tertian parasite, it is more rapid and has to be watched for carefully.

The features to be noticed in the hyaline stage of the quotidian estivo-autumnal parasite are its minute size, never more than one-sixth the size of the red corpuscle; its indistinct outline; the rapidity of its movement. This stage is seen in the circulating blood best during or immediately after a paroxysm.

The pigmented stage.—Just prior to pigmentation the parasite becomes a little larger, loses its ring form, and becomes more refractive and sharply defined, but not as much so as in the malignant tertian parasite. In this parasite I have never observed

a pigmented ring, the rule being that before pigmentation the ring form is lost. The pigment appears as a single, or at the most, two granules, either in the center or at one side of the parasite, and is always perfectly motionless. Sometimes the pigment appears as a rather coarse, irregular block, situated in the center of the parasite, and I have considered such an appearance as denoting the approach of a segmentation. The infected corpuscle is always shrunken, greenish in color, and often crumpled. Often, also, the hemoglobin seems to have retracted around the parasite. At this stage it is never more than one-fourth the size of the corpuscle. The chief points of interest at this stage are loss of ring form before pigmentation, lack of motion of pigment granules, and changes in the infected corpuscle. Pigmented forms are by no means rare in the circulating blood and are most numerous just before or during a paroxysm. The pigment is dark red or black in color. Ameboid motion is lost.

The segmenting stage.—This stage is rarely observed in the circulating blood. I have only observed segmenting bodies three times in over 100 cases of quotidian estivo-autumnal fever, and only in the pernicious type. In blood from the spleen, or in smears from that organ taken after death, segmenting forms are common. In the parasite which has become pigmented little change is noticed prior to the segmentation, save that the pigment is collected in a solid block at the center of the organism, while its protoplasm has become very finely granular in appearance. The pigment may be situated at one side, and the parasite is always round or oval in shape. As segmentation commences, faint radial striations can be detected starting from the center, and soon the organism breaks up into from six to eight minute, round, or oval segments. Marguerite forms are rare, irregular segmenting forms being the rule. A peculiarity of the process of segmentation in this form of the parasite is that it occurs generally inside of the red corpuscle before its entire destruction. In all of the cases in which I have observed segmenting forms in the circulating blood, segmentation had occurred within the corpuscles, and this is one of the characteristic phenomena observed in the life cycle of the quotidian estivo-autumnal parasite. The segmenting bodies are most common just before or during a paroxysm. The chief points of interest at this stage are the granular appearance of the parasite, the occurrence of segmentation within the red corpuscles, and the small number of segments.

The tertian estivo-autumnal parasite.—This is the most common parasite associated with estivo-autumnal fever, and is the one that has been the most studied and is the best known.

The hyaline stage.—Like the quotidian parasite, the first stage in the development of the tertian organism consists of a round hyaline ring or disk, but several important differences are to be noted, i. e., the ring is larger, being from one-third to one-fourth the size of the corpuscle. It is irregular, presenting an enlargement at some portion of its circumference, giving it the so-called "signet ring" appearance. It is highly refractive and is sharply cut, looking as though it had been punched out of the corpuscle; its protoplasm is clear and homogeneous; its ameboid movements slow and sluggish as compared with the quotidian parasite. The ring form is often lost, a clear hyaline disk resulting. The changes in outline are very marked, and it is much easier recognized than is the quotidian parasite. Only very rarely does more than one organism invade a single corpuscle, which is common in the quotidian form. The infected corpuscle is greenish in color and smaller, but it is not so markedly affected as in the quotidian.

The pigmented stage.—In the course of twenty to twenty-four hours, during which time the hyaline body has been ameboid, a few fine pigment granules make their appearance within the ring, generally in the enlarged area at one portion of its circumference, thus giving the organism a still greater resemblance to the signet ring; the ameboid movement continues and the pigment granules are often seen to be in a rapid vibratory motion. The pigment is reddish in color and is present in larger amount than in the quotidian parasite. The organism gradually loses its ring form and becomes larger, sometimes occupying one-half of the corpuscle. At the same time it becomes more clearly defined, its protoplasm more refractive and faintly granular in appearance. The ameboid motion still continues, though very sluggishly, and the pigment tends to collect in a solid block, which has a marked vibratory movement. The pigmented form is somewhat rare in the circulating blood, but blood from the spleen will show great numbers of them. The chief points of interest are appearance of pigment in the ring form, sharply-cut outline and granular protoplasm, motility of the pigment granules, and larger size.

The segmenting stage.—In about forty-eight hours the parasite has grown to be one-half to two-thirds as large as the red corpuscle; the pigment has become motionless and collected in a block near the center, and distinct radial striations are visible. The segments are larger than those of the quotidian organism, are more oval in shape, and number from ten to fifteen, or more. The segmentation usually occurs outside

of the corpuscle. I have observed segmenting bodies but once in the peripheral circulation. The parasite is very refractive, sharply outlined, and the protoplasm is granular.

One of the most characteristic features of the malignant tertian parasite, after the ring form has been lost, is the peculiar refractive, finely granular appearance of the protoplasm, resembling very closely that of the crescents. The pigment is also in finer particles and there are more of them.

Crescentic forms of the estivo-autumnal parasite.—Crescents are developed in the life cycle of both varieties of the estivo-autumnal parasite, and their morphology differs in a few particulars. The tertian estivo-autumnal crescent is large, very slender, with pointed extremities, very refractive, and seldom shows a double outline. Its protoplasm is finely granular, and the pigment large in amount and in the form of slender rods.

The quotidian estivo-autumnal crescent is much shorter and plumper than is the tertian, sometimes being very small. Its extremities are never pointed, but instead are rounded, and it always presents a distinct double outline. The protoplasm is less granular, and in the inclosed pigment is smaller in amount and is in the form of dots.

Presence of the quotidian parasite in the blood in relation to the attack.—During the acme of the elevation of the temperature and the sweating stage the small ameboid parasites are found in the blood within the red corpuscles. The number of the infected corpuscles vary greatly, some cases showing only one or two in the whole specimen, while in others every microscopic field will show several. At this stage the parasites are always unpigmented and often show no ameboid motion for longer or shorter periods of time.

During the afebrile stage the blood will show, besides the ring forms, a few, or many, as the case may be, of small pigmented bodies, generally circular in shape and containing one or two small pigment dots.

Just before the onset of the paroxysm, and often during the initial rise of the fever, larger pigmented forms are present, the pigment generally being collected near the center of the parasite, while the infected corpuscles are very brassy in appearance. The segmenting forms, as has been noted, are only very rarely seen in the circulating blood. In typical cases of quotidian estivo-autumnal fever, or where there is an infection with more than one group of parasites, the presence of the various forms in the blood become irregular or hyaline, and the pigmented forms may be observed at almost any time; but there will always be found a greater number of forms which correspond to the stage of the disease as shown by the clinical chart, and often in a double infection only a very few parasites belonging to one group will be seen, while there are multitudes belonging to the other group present, and it will invariably be found that it is not the most numerous group which is responsible for the clinical symptoms present.

It is this form of the estivo-autumnal parasite which is most often found in the pernicious form of the disease, but it is rare when compared to the form to be described next. The great majority of the cases of remittent malaria occurring in our soldiers in Cuba, and, so far as I have observed, in those returning from the Philippines, are caused by the malignant tertian form of the parasite, but now and again a pure case of quotidian fever will present itself, and the characteristic parasite can always be demonstrated when quinine has not been administered.

Presence of the tertian estivo-autumnal parasite in the blood in relation to the attack.—During the acme of the temperature and until the afebrile stage is reached, the small nonpigmented hyaline ameboid ring forms or disks are found in the circulating blood, with occasionally, at the acme of the fever, a larger pigmented body.

During the afebrile stage the ring forms gradually develop pigment, and the nearer the time of the onset of the paroxysm approaches the larger and more numerous do the pigmented forms become. Just before the paroxysm the blood will probably show a few pigmented forms occupying from one-half to two-thirds of the corpuscle, which is brassy in color, the hemoglobin often being retracted around the parasite. The pigment in such parasites is usually collected at the center and is immotile. Often at the commencement of a paroxysm the blood from the ear or finger will show no parasites and but a few pigmented leucocytes. However, if the blood be examined when the attack is at its height—i. e., when the fever is highest—numerous ring forms will be found. Although segmenting forms can be readily found at the onset of the paroxysm in blood from the spleen, they very rarely occur in blood taken from the ear or finger. Very many cases, both of the quotidian and tertian estivo-autumnal fevers, will be found which show at most but very few of the pigmented parasites in the peripheral blood, and often, though a few ring forms can always be found, provided they are looked for at the proper time and the examina-

tion persisted in. Nowhere does one discover the fact that "patience is a virtue" more quickly than in examining the blood of cases of estivo-autumnal fever. Often a half hour will be spent before a parasite is found, though in the majority of cases so long a search is not necessary. In estivo-autumnal fever the parasites are always most numerous during the apyrexial stage, but there are often seen mild cases of the disease in which only after tedious and repeated examinations of the blood will the parasite be found. In such cases pigmented leucocytes are almost always present, and it is justifiable to make the diagnosis of malaria from them alone.

Differentiation of the tertian and quotidian estivo-autumnal parasites.—Marchiafava and Bignami, in differentiating the tertian and quotidian parasites, call attention to the following:

1. Duration of the life cycle, twenty-four hours in the quotidian, forty-eight hours in the tertian parasite.
2. Pigmentation, greater in the tertian; the pigment motile.
3. Size of parasite, greater in the tertian.
4. Ameboid motion, more marked in tertian and longer preserved.
5. Relation of the various forms to the life cycle.

In my researches I have confirmed most of Marchiafava and Bignami's conclusions, and in the numerous cases of both varieties of estivo-autumnal fever studied have, I believe, been able to trace marked differences in every developmental stage of the parasites. I have already referred to these differences, but will recapitulate them here:

1. *The hyaline stage.*—The tertian estivo-autumnal parasite is larger, more clearly cut and refractive, and has a more sluggish ameboid motion than the quotidian parasite. It has often a signet ring shape, while the quotidian is perfectly round. Only one parasite is found, as a rule, in a corpuscle in a tertian infection, while in the quotidian two or more are common. The infected corpuscle is less crenated and lighter in color when infected by the tertian parasite.

2. *The pigmented stage.*—The tertian parasite is larger and pigmentation occurs while the ring form is still retained. In the quotidian the ring form is never pigmented. Ameboid motion is present after pigmentation, while in the quotidian it is always lost before pigmentation occurs. The tertian parasite is more sharply defined and the pigment present in larger amount is finer and is motile, while in the quotidian the pigment is always motionless and consists of one or two coarse granules. Only one pigmented tertian occurs in a corpuscle, while two or more quotidian parasites may be present in one corpuscle. The infected corpuscle is more crenated and brassy when infected by the quotidian parasite.

3. *The segmenting stage.*—The number of segments is greater in the tertian and the segments are more oval in outline and larger. Segmentation occurs outside the red corpuscle in the tertian estivo-autumnal parasite, while in the quotidian it occurs within the infected corpuscle.

4. *The crescentic stage.*—The tertian crescents are longer and more narrow than the quotidian, are more deeply pigmented, and have less of a double outline. The protoplasm of the tertian crescent is more refractive and granular in appearance.

5. *The flagellated stage.*—In the tertian parasite, both forms of flagellate bodies heretofore described are larger and more deeply pigmented than in the quotidian.

6. *The cycle of development.*—Twenty-four hours completes the cycle of development within the human body in the quotidian parasite. Forty-eight hours in the tertian.

When we add to these numerous morphological differences the typical clinical phenomena exhibited by these parasites, it must, I think, be admitted that there are at least two varieties of the estivo-autumnal parasite, a tertian and quotidian, and from my own observations I can arrive at no other conclusion.

It may be urged that the differences noted may be due to special conditions of environment, or unusual factors affecting the health of the individual, etc., and while, of course, we are unable to prove that this may not be so, yet they are so constant and harmonious that it is impossible to believe that they are accidental, and until such theories can be proven, I shall continue to believe that the estivo-autumnal malarial parasites are divided into at least two varieties, the quotidian and tertian parasite. In the examination of the blood of patients returning from the Philippine Islands who have previously suffered from malarial fever, the marked anemia which most of them show is very noticeable. This condition is strictly a post-malarial one, due to the destruction of the blood corpuscle by the malarial parasite. Blood counts have been made of most of these cases as well as microscopical examinations. The reduction in the number of red corpuscles has been found to be, as a rule, very marked, many of the patients showing but 500,000 to 1,000,000 red cells per cubic millimeter. In the estivo-autumnal malaria the anemia produced by repeated attacks may be extreme and also very persistent, while, unlike the tertian and quotidian forms,

the regeneration of the red cells occurs very slowly. The lowest number of red corpuscles to the cubic millimeter which I have observed at this hospital has been 435,000 and the patient in this case recovered and was returned to duty in six weeks. There have been five cases of pernicious anemia following malaria observed at this hospital in which the result was fatal. In all these cases an examination of the blood showed a marked reduction in the number of the red corpuscles and many of the corpuscles were deformed but no nucleated red cells were observed. The reduction in the hæmaglobin was equal in ratio to the reduction in the number of the red cells. The white cells were reduced in number but the large mononuclear were increased in number. At the time of the paroxysm an apparent leucocytosis is often noticed, but this is only apparent, for, as a rule, the white cells are reduced in number. A real leucocytosis is generally an indication of the presence of some complication.

As shown by the fatal cases of post-malarial anemia which have occurred at this hospital, the anemia following estivo-autumnal attacks is not always benign. Two forms of pernicious anemia following malaria have been described by Bignami, Bastianelli, and Dionisi:

I. A form resembling in its clinical symptoms, blood findings, and pathology, the classical type of pernicious anemia. In this form the blood shows poikilocytosis, the presence of microcytes, abnormal state of red corpuscles and nucleated red cells usually megaloblasts.

II. The second form is more interesting, for while it is generally fatal the blood does not show any nucleated red cells. This lack of nucleated red cells is probably due to the almost complete absence of regenerative power in the blood-forming organs, and the condition is similar to that found after profuse hemorrhage of any cause.

The cases of fatal pernicious anemia following malaria observed here have been of the latter type, none of them showing nucleated red cells in the blood, the chief pathological feature being the marked reduction in the number of red corpuscles. This reduction has been very great in the cases observed here, ranging from 450,000 to 600,000 red cells per cubic millimeter before death occurred. Leucocytes were decreased in number, but there was often noticed an increase in the eosinophiles. The blood in these cases showed but a very slight degree of poikilocytosis, but there was a great difference in the size of the cells.

The post-mortem findings in cases of pernicious anemia following malaria have been so similar as to be almost characteristic of this disease. The bodies were not greatly emaciated, the skin being of a yellowish hue; rigor mortis slight; the subcutaneous fat and muscular tissue well preserved. All of the cases showed an increase in fatty tissue throughout the body. The organs, as a rule, presented a very anemic appearance, the kidneys usually being in a condition of subacute parenchymatous nephritis. The liver presented invariably a condition of fatty degeneration, and the lungs were oedematous. In several cases there was pleurisy with effusion in one or both of the pleural cavities. The amount of fat around the organs and in the greater omentum was very noticeable, but the most characteristic change present was found in the pancreas. In every case the pancreas was very markedly hypertrophied and almost white in color. The consistence of the organ was much increased and upon microscopical examination this was found to be due to the marked increase in the connective tissue of the organ. Invariably the pancreas was found surrounded by a large amount of fat. The spleen was always found enlarged, the parenchyma pigmented and greatly decreased in consistence. As a rule, the heart was found to be undergoing fatty degeneration. In all the cases the blood was found to clot very slowly and the color varied from a slight red to a yellowish red.

Microscopical examination of sections from the organs in these cases showed nothing very characteristic, save the increase in the connective tissue of the pancreas which has already been spoken of. The heart muscle showed a slight fatty degeneration in every case. The kidneys were generally found in a condition of subacute parenchymatous nephritis. The liver showed a profuse fatty degeneration, and the spleen the usual condition found in chronic malarial poisoning, i. e., marked pigmentation; the presence of a few parasites, and venous congestion of the splenic sinuses.

In all the cases dying from pernicious anemia following malaria, the most heroic treatment failed to produce an increase in the red blood corpuscles, the patient steadily declining in strength until the fatal issue. It is impossible to say, however, whether or no a case of anemia following malaria will be pernicious, as I have observed a large number of cases which presented very low blood counts and all the typical symptoms of the pernicious form, but which recovered under proper treatment. The prognosis, therefore, is generally good, the blood regaining its normal number of red cells in weeks or months, even after a marked reduction in number. The prognosis in a case which assumes the pernicious type is very grave, death soon occurring. The most marked reduction in number, however, is no index of the final outcome of the anemia and should not be considered as discouraging.

Latent and masked malarial fever.—A routine examination of the blood in every case entering this hospital has demonstrated that a considerable portion of cases of malaria which have been contracted in the Philippines, present no definite symptoms, or the symptoms are masked by those of some other disease. The subject of latent and masked malarial fever has not received the attention which it deserves. If such a thing could be possible as a microscopical examination of the blood in all the cases of disease, in all parts of the world, it is safe to say that the number of cases due to the presence in the blood of the malarial parasites would be so surprising as to be almost unbelievable.

In the latent and masked malaria are included all the cases in which the parasite may be demonstrated in the blood, but in which no clinical symptoms are present, or the symptoms present are not those typical of malarial infections. A still closer definition of the terms "latent and masked" may be made as follows:

The latent malarial fevers are those in which the parasites may be demonstrated in the blood, but in which no clinical symptoms of any disease are present.

The masked malarial fevers are those in which the parasites may be demonstrated in the blood, but in which the symptoms present are those of some other disease, or are atypical.

In the first class are included those cases in which the disease is discovered accidentally through the examination of the blood as a matter of routine practice or some other purpose. Such cases have shown absolutely no symptoms of malaria, yet the parasites pursue their life cycle in the blood, but in small numbers. These cases have been rather numerous in my experience in the examination of the blood in soldiers returning from the Tropics. As a rule in such cases the parasites are few in number, but there is generally a great deal of pigment present and numerous pigmented leucocytes. The tertian estivo-autumnal parasite is the one most commonly found in this class of infection, but the quotidian form is by no means rare.

The only explanation of the fact that the development of the malarial parasites in the blood may not, for a considerable length of time, be accompanied by clinical symptoms of the disease is that they are so few in number that comparatively little of the malarial poison is produced, or else that the infected individual is very resistant to the action of the poison.

The length of time during which such latent infection may exist is not yet determined, but I have no doubt that in some cases it may be for weeks. As proof of this I have records of one case in which estivo-autumnal parasites were found in the blood for six weeks before the paroxysm occurred, repeated blood examinations being made during that time. I have records of many cases in which the parasites were found for from seven to fourteen days before clinical symptoms appeared.

The masked form of malarial infection is much more common than the latent form, and its recognition is very important from a practical point of view. Such cases have often presented no rise of temperature, and in fact the temperature is often subnormal. Nervous symptoms, such as slight headache, vertigo, neuralgia of various parts of the body, etc., or symptoms referable to some other disease may be present. The most common disease which masked malarial fever presents in soldiers returning from the Philippine Islands are acute and chronic enteritis, chronic dysentery, and tuberculosis. During the past year I have kept a record of all cases in which the malarial parasites were found in the blood, but in which no clinical symptoms were present, or the symptoms present were those of some other disease. None of these cases were diagnosed as malaria, and in many instances the prompt institution of treatment by quinine resulted in the cure of the cases which were supposed to have been due to other causes.

The total number of cases in which the malarial parasites were demonstrated, but no diagnosis of malaria made, was 172. These cases may be divided as follows:

Tertian infections.....	36
Estivo-autumnal infections.....	131
Quartan infections.....	1
Combined infections.....	4

Tertian infections.—In all the tertian infections the parasites were found undergoing their normal life cycle within the peripheral blood. The diagnoses of these cases before the blood examination, as entered upon the pathological blank, were as follows:

Chronic dysentery.....	12	Articular rheumatism.....	1
Chronic diarrhea.....	2	Hernia.....	1
Wounds.....	2	Acute constipation.....	1
Gastro-enteritis.....	1	Appendicitis.....	1
Fractures.....	1	Refinitis.....	1
Pulmonary tuberculosis.....	1	No diagnosis.....	11
Acute bronchitis.....	1		

From the foregoing it will be seen that chronic dysentery was the most common diagnosis made in these cases, and in most instances the patients suffered from considerable diarrhea, but in two-thirds of them treatment by quinine not only caused the disappearance of the parasites, but also cured the diarrhea. The cases in which no diagnosis was made were all cases of latent infection, the patients presenting no symptoms referable to any disease. It is probable that they had suffered from malaria in the Philippines, but under treatment had improved, and were transferred to the United States because of their debilitated condition.

Estivo-autumnal infections.—The estivo-autumnal infections, numbering 131 cases, were diagnosed as follows:

Chronic dysentery.....	43	Tachycardia	1
Chronic diarrhea.....	15	Paralysis	1
Pulmonary tuberculosis.....	8	Insanity	1
Wounds	3	Acute pharyngitis	1
Chronic gastritis.....	3	Dipsomania	1
Hernia	2	Furuncle	1
Syphilis	2	Rheumatism	1
Otitis-media.....	2	Chronic nephritis	1
Acute melancholia	2	Uraemia	1
Asthma.....	1	Varicocele	1
Fractures	1	General debility.....	1
Pneumonia	1	Acute bronchitis	1
Cellulitis	1	No diagnosis	34
Chronic dyspepsia.....	1		

These 131 cases of estivo-autumnal fever may be divided, as regards their etiology, as follows:

Tertian estivo-autumnal infections.....	102
Quotidian estivo-autumnal infections	29

The tertian estivo-autumnal cases were divided as follows:

Chronic dysentery.....	35	Dipsomania	1
Chronic diarrhea	12	Rheumatism	1
Pulmonary tuberculosis.....	3	Fracture	1
Wounds	3	Chronic nephritis	1
Acute melancholia	2	Furuncle	1
Chronic gastritis.....	2	Cellulitis.....	1
General debility	1	Acute bronchitis.....	1
Insanity	1	Pneumonia	1
Syphilis	1	Paralysis.....	1
Otitis-media	1	Chronic dyspepsia	1
Appendicitis	1	No diagnosis	30

The quotidian estivo-autumnal infections were diagnosed as follows:

Chronic dysentery.....	8	Furuncle	1
Pulmonary tuberculosis.....	5	Otitis-media	1
Chronic diarrhea	3	Uraemia	1
Chronic gastritis.....	1	Syphilis	1
Asthma.....	1	Tachycardia	1
Acute pharyngitis	1	No diagnosis	5

The quartan infections.—There was one case which showed the presence in the blood of the quartan parasite. This case was diagnosed as chronic dysentery.

Combined infections.—There were four cases of combined tertian and estivo-autumnal malaria, all of which were diagnosed as chronic dysentery.

From the consideration of these cases in which the malarial parasites were found in the blood, but in which it was impossible to diagnose the infection, it will be seen that the diagnosis of chronic dysentery was altogether the most common. This was probably due largely to the fact that many of these cases were suffering from chronic dysentery and malaria as a complication, but it should not be forgotten that many cases of pure malaria present symptoms which are referable to the intestinal tract, such as diarrhea, indigestion, etc., and the fact that many of these cases recovered under quinine, even from the intestinal complication, conclusively proves that this is the case. In my opinion every case of diarrhea or dysentery should have a blood examination for the parasites of malarial fever.

The diagnosis of pulmonary tuberculosis in these cases was in every instance due

to the emaciated condition of the patient and the rise in temperature which resembled that of the disease in question. It will be seen that of the thirteen cases so diagnosed eight were due to the tertian estivo-autumnal parasite and five to the quotidian parasite. The administration of quinine in these cases resulted in complete recovery. Here again the importance of the examination of the blood in cases of suspected pulmonary tuberculosis is manifest.

The most important lesson taught from this large number of cases in which malaria was not suspected is the importance of examining the blood of every case of disease arising in the Tropics and how little faith can be placed in the clinical symptoms which may be present. While many of these cases were complicated by the disease which was diagnosed, it was invariably found that the termination of the malarial infection by treatment with quinine resulted in a general improvement of the condition present.

An interesting fact shown by the examination of blood at this hospital has been the occurrence together of the parasites of malarial fever and the amœbæ of dysentery. Of the cases which were diagnosed as chronic dysentery and proved to be infected with the malarial parasites, 10 per cent showed the amœbæ of dysentery in the feces.

Reference to the table will show that a great majority of the cases of latent and masked malarial fever were infected by the estivo-autumnal parasite. This fact is of the greatest importance, as it demonstrates how this fatal type of malarial parasite may be present without producing any definite clinical symptoms. In such cases it is very important to recognize the presence of this organism in soldiers campaigning in the Tropics under many climatic and sanitary conditions which deplete the strength and render the individual more susceptible to disease. The presence of this parasite in the blood should always be considered as a serious matter, for it may at any time begin to multiply rapidly and give rise to pernicious symptoms. The microscopical examination of the blood enables us to recognize its presence oftentimes when it is not suspected, and this enables us to apply the proper treatment with the greatest chance of success and with the least discomfort to the patient.

Widal test.—There were comparatively few Widal tests made during the year, as there has been no epidemic of typhoid fever in the camps here, nor do we receive many cases from the Philippines. There were 110 tests made in all, of which only 9 proved positive. Of these 9 positive cases, 4 were patients returning from the Philippine Islands, and the remaining 5 were patients received from the recruit camp.

Estimation as to number of red blood corpuscles.—There have been 168 blood counts made during the year in cases suffering from anæmia. Many of these counts have shown a very great reduction in the number of red cells, a large number being below 1,000,000 red cells per cubic millimeter, and one case showed only 420,000 red cells to the cubic millimeter before death. Most of these low blood counts were in cases suffering from anæmia secondary to other diseases, such as dysentery, malaria, and typhoid fever. Only three cases of typical pernicious anæmia occurred during the year.

(B) EXAMINATIONS OF URINE.

During the year 5,935 specimens of urine were examined chemically and microscopically. It has been the rule to examine the sediment of every urine microscopically, whether or no albumen was present. This has been rendered possible by the installation in the laboratory of an electric centrifuge. The results obtained by the examination of the urine are as follows:

	Cases.
Albumen was found in.....	845
Pus in	431
Blood in.....	68
Casts in.....	338
Sugar in.....	34
Spermatozoa in	23

Examination of urine for effect of anesthetics.—During the year a careful record has been kept of the results of the examination of the urine of cases operated upon at this hospital under anesthesia. The method of obtaining these results is as follows: An examination of the urine is made just before the operation. Immediately after the operation the urine is drawn by a catheter and examined. In those cases in which the urine showed an abnormal condition it was examined every twenty-four hours until it became normal.

One hundred and fifty-six specimens of urine were thus examined for the effect of anesthetics, with the following results:

	Cases.
Albumen was found in.....	14
Hyaline casts in.....	3
Granular casts in.....	5
Granular and hyaline casts in.....	3
Granular and epithelial casts in.....	3
Hyaline and epithelial casts in.....	1
Normal.....	127

In all the cases the urine showed a marked increase in specific gravity.

The anæsthetic used has been almost invariably chloroform, although ether has been used in a few cases. Those cases in which ether was used showed no abnormal condition of the urine after operation, beyond an increase in specific gravity.

The urine of all cases which showed albumen or casts became normal in a few days, thus showing that the effect of the anæsthetic was transitory.

From the above results it will be seen that in ordinary surgical work the effect upon the kidneys of chloroform is not of great importance. While chloroform undoubtedly may cause an acute congestion of the kidney, this congestion is only temporary and speedily passes away without leaving, so far as can be seen, any permanent disability. A large number of chemical examinations were made in these urines to determine the relative amounts of chlorides, sulphates, phosphates, and urea present after the administration of the anæsthetic. The results obtained have been so contradictory, however, that they are of no scientific value, although the excretion of urea was found to be almost invariably increased.

Examinations of urine for the bacillus of tuberculosis.—There have been eight specimens of urine examined for the bacillus of tuberculosis, only one of which proved positive. In this specimen the bacilli were very numerous and the autopsy showed a marked tuberculosis of the testicle, prostate, and neck of the bladder.

(C) EXAMINATIONS OF SPUTA.

During the year 1,082 specimens of sputa were stained and examined for the bacillus of tuberculosis, with a positive result in 169 cases. It has been found that in many instances the sputa of patients returning from the Philippines contains so very few bacilli that repeated examinations are necessary before they can be demonstrated. Accordingly, an order was issued requiring at least six sputa examinations in cases of suspected tuberculosis before a case could be considered negative. This order has resulted in the demonstration of the bacilli in quite a number of cases in which from two to four examinations had been negative. It has also caused a very large negative result in the total number of sputa examinations.

(D) EXAMINATIONS OF FECES.

During the year 1,116 specimens of feces were examined for the amoeba of dysentery with a positive result in 223 cases. In my report of last year I stated that of 313 examinations of feces only 8 showed the presence of the amoeba. It will be seen that this year the number of cases showing the amoeba is very much larger and is probably explained by the large number of United States volunteers who were returned during the year to be mustered out, who would otherwise have remained on duty in the Philippine Islands, even though suffering from attacks of amoebic dysentery. It is a well-known fact that cases suffering from this disease often recover sufficiently to return to duty, even though this recovery is, as a rule, followed by a relapse.

The large percentage of amoebic dysentery found in the Philippines, and which did not agree with the results obtained at this hospital, is undoubtedly very largely explained by the fact that the greater number of cases of amoebic dysentery were not returned to the United States immediately, but only after two or more attacks. This was especially true in the case of volunteers, many of whom, although suffering from relapses of this disease, were able in the intervals to do duty. When, therefore, these men were returned to be mustered out according to law, the percentage of amoebic dysentery found at this hospital was greatly increased.

Another feature which undoubtedly appears in lowering the percentage in which amoebæ are present in the feces, as compared with the results obtained in the Philippines, is that during the passage across the Pacific many of the cases recovered apparently under a change of climate and medical treatment, and when they reached this hospital were having the normal number of bowel movements, with no evidence of dysentery. Such cases were examined, and if thought able to do duty were imme-

diately transferred to the camps at the Presidio, and were never entered at this hospital as patients.

There have been a few fatal cases diagnosed as amœbic dysentery observed at this hospital in which the amœbæ were present in the fæces, but which upon autopsy were found to present no evidence of the disease. These cases will be referred to more fully in another section of this report.

Cercomonas intestinalis was present in the fæces of 30 cases diagnosed as chronic dysentery. They were almost invariably accompanied by the amœbæ. In only one case were tænia segments observed. In no case was the *anchylostoma duodenalis* found.

(E) EXAMINATIONS OF POST-MORTEM MATERIAL.

There were 163 autopsies performed at this hospital during the year, and in all these cases sections of the viscera were prepared and stained. In all, 798 sections have been prepared. The following is the cause of death in the cases autopsied:

	Cases.
Chronic dysentery (follicular 18, diphtheritic 30, gangrenous 2, amœbic 23)	73
Pulmonary tuberculosis.....	22
Lobar pneumonia.....	19
Chronic enteritis.....	7
Broncho-pneumonia.....	6
General miliary tuberculosis.....	5
Acute septicæmia.....	4
Empyema.....	4
Acute nephritis.....	4
Pernicious anemia.....	3
Acute peritonitis.....	2
Acute meningitis.....	2
Chronic nephritis.....	2
Enteric fever.....	2
Valvular disease of the heart.....	2
Chronic colitis.....	2
Carcinoma of larynx.....	1
Pernicious malarial fever.....	1
Cerebral apoplexy.....	1

In order to obtain a comprehensive view of the complications which have accompanied the disease causing the greatest number of deaths at this hospital, I have prepared the following table, showing the cause of death and the complications observed:

Cause of death.	Number of cases.	Complications.
Chronic dysentery:		
Follicular.....	18	Acute nephritis, 7 cases; chronic enteritis, 11; chronic gastritis, 6; fatty degeneration of the liver, 6; chronic pleurisy, 6; chronic nephritis, 3; venous congestion of liver, 3; lobar pneumonia, 3; arterio-sclerosis, 3; acute pericarditis, 2; chronic bronchitis, 2; subacute parenchymatous nephritis, 3; lobar pneumonia, 3; infarcts of lung, 2; cirrhosis of spleen, 2; cirrhosis of liver, 1; infarcts of spleen, 1; pulmonary tuberculosis, 1.
Diphtheritic.....	30	Chronic enteritis, 24; chronic gastritis, 20; cirrhosis of spleen, 18; subacute parenchymatous nephritis, 15; acute tubular nephritis, 11; fatty degeneration of liver, 10; venous congestion of liver, 10; chronic pleurisy, 10; hypostatic pneumonia, 10; melanosis of spleen, 4; chronic bronchitis, 3; cirrhosis of liver, 3; metastatic abscess of liver, 2; acute pericarditis, 2; lobar pneumonia, 1; acute peritonitis, 1; acute pleurisy, 1; fibroid pneumonia, 1; pulmonary tuberculosis, 1.
Gangrenous.....	2	Chronic enteritis, 2; chronic gastritis, 2; fatty degeneration of liver, 2; acute peritonitis, 1; acute nephritis, 1; subacute nephritis, 1; broncho-pneumonia, 1; arterio-sclerosis, 1.
Amœbic.....	23	Chronic enteritis, 17; chronic gastritis, 10; acute nephritis, 13; abscess of liver, 9; cirrhosis of spleen, 9; venous congestion of liver, 8; fatty degeneration of liver, 7; subacute parenchymatous nephritis, 7; acute peritonitis, 5 (3 due to liver abscess opening into abdomen); chronic nephritis, 2; hypertrophy of heart, 2; pulmonary tuberculosis, 2; abscess of kidney, 2; empyema, 2 (both due to rupture of liver abscess into the pleural cavity); acute pericarditis, 1 (due to perforation of amœbic abscess into the pericardial cavity); acute bronchitis, 1; chronic pleurisy, 1; arterio-sclerosis, 1.

Cause of death.	Number of cases.	Complications.
Chronic enteritis	7	Fatty degeneration of liver, 6; acute nephritis, 5; chronic pleurisy, 3; chronic gastritis, 5; cirrhosis of spleen, 3; venous congestion of liver, 3; subacute parenchymatous nephritis, 2; colitis, 2; chronic nephritis, 1; venous congestion of spleen, 1; fatty degeneration of heart, 1; acute bronchitis, 1; bronchopneumonia, 1; arterio sclerosis, 1.
Pulmonary tuberculosis	22	Acute nephritis, 14; tuberculosis of intestine, 12; fatty degeneration of liver, 10; chronic pleurisy, 8; venous congestion of liver, 8; chronic enteritis, 5; empyema, 5; cirrhosis of liver, 4; cirrhosis of spleen, 4; acute pericarditis, 3; chronic gastritis, 3; tuberculosis of kidneys, 2; tuberculosis of spleen, 2; chronic dysentery, 2; chronic pericarditis, 2; acute pleurisy, 2; tuberculosis of liver, 2; amoebic dysentery, 1; chronic nephritis, 1; tubercular meningitis, 1; chronic colitis, 1; ascites, 1; acute appendicitis, 1.
Lobar pneumonia	19	Acute nephritis, 15; acute pleurisy, 15; fatty degeneration of liver, 14; venous congestion of liver, 10; acute pericarditis, 9; hypertrophy of heart, 16; acute splenitis, 8; chronic enteritis, 6; acute gastritis, 4; chronic gastritis, 2; subacute parenchymatous nephritis, 2; acute meningitis, 1; chronic pleurisy, 1; arterio sclerosis, 1.
Broncho-pneumonia	6	Acute nephritis, 6; acute pleurisy, 5; hypertrophy of heart, 4; venous congestion of liver, 4; acute pericarditis, 2; chronic enteritis, 1; chronic gastritis, 1.
Pernicious anemia	3	Subacute parenchymatous nephritis, 3; venous congestion of liver, 3; fatty degeneration of liver, 3; dilatation of right heart, 3; acute pleurisy, 2; oedema of pericardium, 2; hypertrophy of spleen, 1; bronchopneumonia, 1.

From the foregoing table it will be seen how numerous are the complications which attend some of the diseases which produce the greatest fatality in soldiers returning from the Philippine Islands. Because of their importance I wish to consider, somewhat at length, the complications attending dysentery.

Complications observed at autopsy in cases of dysentery.—In the study of post-mortem material presented in autopsies upon patients dying at this hospital from dysentery, I have paid especial attention to the pathological conditions present in the various organs. These have been so constant, and in many instances so important, that it seems to me that they should be considered more at length than they are in most of the text-books upon medicine. In looking up the subject of the complications attending dysentery in recent works, I have been surprised at the scant attention which they have received. For instance, in Davidson's article upon dysentery in Volume II of Allbutt's System of Medicine no mention whatever is made of the complications attending the disease. In Lafleur's article upon amoebic dysentery in the same volume, the complications attending it are dismissed in a very few lines, the only ones which received much attention being abscess of the liver and intestinal perforation. This lack of detailed description of the complications in dysentery is the more surprising, as in the cases which have died at this hospital the complications have been very severe, and in many instances have been the cause of death. While it is possible that many of the complications may have been due to campaigning in tropical countries, with the incident hardships and lack of hygienic living, yet many of them are so constant that it is impossible not to believe that they are due to the disease itself.

In considering the subject I shall first consider the complications as a whole, without relation to their occurrence in the various forms of dysentery observed here, and afterwards consider the complications as relative to the different varieties of the disease. In the 73 cases of fatal dysentery which have been autopsied the complications present may be divided as follows:

Complications observed in the nervous system.—The brain in nearly every case in which it was examined (35) showed an increase in the amount of cerebro-spinal fluid. Often this increase was very excessive, the brain being oedematous. Upon dissection of the brain the lateral ventricles were invariably found filled with fluid and the choroid plexus was invariably congested. In all the cases of amoebic dysentery the blood vessels of the cerebrum were very much congested and in about one-half of the cases small capillary hemorrhages had occurred. In all the cases of follicular dysentery the cut surface of the cerebrum was anæmic in appearance, while in the diphtheritic and gangrenous forms the cut surface was as a rule congested. In 3 cases of amoebic dysentery and in 2 of the gangrenous form small areas of softening were presented in the frontal lobes near the median fissure.

Complications observed in the respiratory system.—The most common conditions found complicating dysentery, in the lungs, were emphysema and bronchopneumonia.

Of the 73 cases, 42 showed an emphysematous condition of the lungs, while 21 showed a condition of bronchopneumonia. Perhaps a better name to designate this pneumonia is hypostatic, as it is probably due to maintaining a recumbent position for so long a time, but as the pathological conditions are identical with those found in bronchopneumonia I have preferred to retain that name. Another very common condition found is chronic pleurisy, which was found in 16 cases. This condition was evidently, in all these cases, of long standing. Lobar pneumonia occurred in 4 cases and was the cause of death in all. Chronic bronchitis occurred in 5 cases, acute bronchitis in 1 case, acute pleurisy in 1 case, infarcts of lung in 2 cases, and pulmonary tuberculosis in 3 cases. Empyema was found in 2 cases, both due to a rupture of liver abscess into the pleural cavity. Metastatic abscesses of the lung were found in both cases of gangrenous dysentery, and in both cases was associated with abscess of the spleen and kidney. The two most frequent complications in the respiratory system were emphysema and bronchopneumonia and these are also the two which would be most likely to occur, owing to the weakness and recumbent posture of the patient. In every case a good deal of congestion of the lower lobes of the lungs was observed, but I have only considered the condition as one of bronchopneumonia when the characteristic pathological lesions were present upon microscopical examination.

Complications observed in the circulatory system.—In 51 of the cases the amount of fluid in the pericardial cavity was markedly increased. This oedema of the pericardium is one of the most characteristic complications observed in the fatal cases of dysentery. The fluid was in most instances clear, of a light yellowish color, but in a few cases small shreds of fibrin were present.

Acute pericarditis.—This complication was observed in 5 cases, and in every case the effusion was purulent. In 1 case the pericarditis was due to perforation of an amebic abscess of the liver into the pericardial cavity.

The heart.—In none of the cases were any of the complications present due to a disease of the heart. Arteriosclerosis was presented in only 2 cases—1 of the gangrenous dysentery and the other amebic dysentery.

Complications observed in the genito-urinary system—Kidneys.—Some form of inflammation of the kidney was presented in almost every case of dysentery which came to autopsy. Thus, out of 73 cases 63 showed some form of nephritis. Of the varieties of the inflammation of the kidney, acute tubular nephritis was the most common, 32 of the 63 cases being caused by this variety. Next in frequency comes the subacute parenchymatous form, which furnishes 26 of the cases. The remaining 5 were due to chronic interstitial nephritis.

In every case of dysentery which has come to autopsy at this hospital there has been more or less congestion of the kidneys, but microscopical appearances of nephritis were present in 63 of the cases. This very large percentage of kidney disease accompanying chronic dysentery would seem to indicate that the kidneys are especially susceptible to the poisons which are elaborated during the process of the dysenteric infection. There was nothing peculiar noticed about the microscopical appearance of the sections from the kidneys in nephritis complicating dysentery beyond the fact that in the gangrenous cases there were present minute abscesses due to the lodgment of some bacterial emboli in the organs.

In those cases which presented a chronic interstitial form of nephritis there was a history of alcoholism which probably accounted for the character of the complication.

Complications observed in the glandular system—The liver—fatty degeneration.—The most common complication found in the liver was fatty degeneration, which was present in 35 of the cases. Upon microscopical examination the fatty degeneration was found to be very extensive, in most instances large areas being apparently composed of fat, all trace of the liver tissue having been lost.

Venous congestion.—The next most common complication observed in the liver was chronic venous congestion, present in 21 cases. Microscopically this condition was often shown to be very marked, the capillaries being gorged with blood, and in many cases having ruptured into one another and destroyed the liver tissue in the vicinity.

Cirrhosis.—Cirrhosis of the liver was observed in four cases. In all, the condition was one of common interlobular cirrhosis of slight extension. In a large number of cases, however, a condition was presented which was evidently the commencing stage of cirrhosis, in that while the increase in the interlobular connective tissue was somewhat increased in amount, the condition was not well enough established to class it as a distinct cirrhosis. In most cases this increase in the connective tissue was undoubtedly due to a recent profuse hepatitis.

Metastatic abscesses.—In 2 cases of dysentery metastatic abscesses were found. This condition is somewhat rare in the liver, but it is common in the lungs, as a rule, although in the cases observed this year metastatic abscesses occurred with the same frequency in both situations.

Amœbic abscesses.—Amœbic abscesses of the liver occurred in 9 of the fatal cases of dysentery, and in all cases in which it occurred the classical pathological findings of amœbic dysentery were present.

These liver abscesses varied in size from small ones, measuring about 2 centimeters in diameter to those measuring 12 centimeters in diameter, and in number from 1 to 10. They contained, as a rule, greenish pus, with blood and a chocolate-colored substance. Their walls were very ragged in appearance, however, there being very seldom any well-marked fibrous layer bounding the abscess. In 3 cases abscesses of the liver had perforated into the pleural cavity, causing empyema, and in 1 case the abscess perforated into the pericardial cavity, causing acute pericarditis. Thus it will be seen that of the 9 cases of amœbic abscess of the liver 6 had perforated and given rise to complications which caused death.

The spleen.—Cirrhosis.—Altogether the most common complication observed in the spleen was cirrhosis of the organ, due to the increased growth of the connective tissue of the capsule, trabeculae and the Malpighian corpuscles. This condition was present in 29 cases, being the most common in the diphtheritic variety of the disease. In the cases of gangrenous and amœbic dysentery there was generally present an acute inflammation of the spleen, as shown by its congestion, tense capsule, and diffident consistence.

Infarcts.—Two cases of dysentery showed infarcts of the spleen.

Melanosis.—Melanosis of the spleen, due to previous or concurrent malarial infection, was present in 4 cases.

Complications observed in the digestive system.—Chronic enteritis.—As would be expected, chronic enteritis almost invariably accompanied the dysenteric process. Of the 73 cases, 54 showed a marked chronic enteritis, while 10 of the 19 remaining showed some inflammation of the small intestines, but not marked enough to class as a distinct enteritis. In all the cases which I have considered as enteritis the inflammatory condition present extended as far as the stomach.

Chronic gastritis.—Next in frequency to chronic enteritis, as a complication, comes chronic gastritis, which was present in 38 of the cases. In nearly every case the gastritis was of considerable severity.

Perforation of the intestine.—In 4 cases perforation due to dysenteric ulcerations of the intestine was present. In all these cases the perforation occurred in the rectum.

Acute peritonitis.—In 7 cases acute peritonitis was found at autopsy, due in 3 cases to perforation of a liver abscess into the abdominal cavity, and in the remaining cases to perforation of the intestine by dysenteric ulcers.

Complications in relation to the type of dysentery.—As regards the frequency of the occurrence of the various complications in the various types of dysentery, I shall consider only those which are of the most importance. Abscess of the liver occurred only in the amœbic and diphtheritic forms. Of 23 cases of amœbic dysentery, 9 showed liver abscesses. Of the 30 cases of diphtheritic dysentery, 2 showed the presence of metastatic abscess in the liver.

Nephritis.—Acute nephritis was present most often in the amœbic form of the dysentery, 13 out of 23 cases showing it. Next in frequency comes the diphtheritic variety, which presents 11 cases out of 30. The follicular form of dysentery showed the fewest cases of nephritis, only 7 out of 18 being observed. If we consider the cases of gangrenous dysentery, it is seen that 1 case of 2 presented an acute form of nephritis, giving a percentage of 50, but the number of cases observed is not sufficient for us to base any conclusions upon.

Subacute parenchymatous nephritis was the most common in the diphtheritic form of the dysentery, 15 out of 30 cases presenting it. Next in frequency comes the amœbic form, in which 7 out of 23 cases showed it, while the follicular form showed 3 out of 18 cases. The gangrenous form showed 1 out of 2 cases. Chronic nephritis was the most common in the follicular form of dysentery, 3 out of 18 cases showing it.

Fatty degeneration of the liver.—This complication was the most common in the follicular and diphtheritic forms of dysentery, the follicular form showing 6 out of 18 cases, and the diphtheritic form 10 out of 30 cases. The amœbic form showed 7 out of 23 cases.

Venous congestion of the liver.—This complication was most common in the diphtheritic form of dysentery, 10 cases out of 30 presenting it. The amœbic form presented the condition in 8 cases out of 23, and the follicular form in 3 cases out of 18.

Cirrhosis of the spleen.—This complication was most frequent in the diphtheritic form of dysentery, 18 out of 30 cases showing it. The next in frequency is the amœbic dysentery, with 9 cases out of 23, while only 2 instances of it occurred in the 18 follicular cases.

Acute peritonitis.—Acute peritonitis was most common in the amœbic form of dysentery, 5 out of 23 cases presenting this complication. In 3 cases it was due to

rupture of liver abscess, and in 2 to the perforation of the intestines. The gangrenous form of dysentery showed 1 case of acute peritonitis, due to perforation of the intestines, which was also true of the diphtheritic form.

From the above summary of the complications of the various forms of dysentery it will be observed that the most serious complications are most frequent in the severer forms of the dysenteric process; as, for instance, in the diphtheritic, gangrenous, and amœbic types, while they are the least common in the follicular form, which is also the least severe from a pathological standpoint.

From the study of the complications which attend dysentery it will be seen how numerous and important they are. It is not too much to say that in a large proportion of the cases which resulted fatally death was due more to the complications than to the dysenteric affection.

The various forms of dysentery.—During the past year, from the study of the cases on the post-mortem table, I have seen no reason for changing my conceptions of the various forms of dysentery, considered from the standpoint of a pathologist. Considered in this way I make the following distinctions as to classification: Chronic dysentery nonamœbic and chronic dysentery amœbic. In the nonamœbic there may be recognized three stages of the disease, i. e., follicular, pseudodiphtheritic, and gangrenous. These three stages, however, belong to one process, the disease beginning as the follicular affection and gradually assuming the process found in the pseudodiphtheritic and gangrenous form. In other words, the three divisions named are simply stages of one process, the gangrenous being the result of the follicular and pseudodiphtheritic. I believe that a certain portion of this nonamœbic dysentery is the chronic form of specific dysentery observed in the Philippines. This I believe because I have been able, in a few instances, to separate the bacillus of Shiga from the intestine in cases of the follicular and pseudodiphtheritic forms of dysentery which have died at this hospital.

Under the amœbic form I include all cases of dysentery in which the amœbæ are present in the feces and which present at autopsy the characteristic pathological picture which is found in dysentery due to the amœbæ.

The pathological appearance present in the intestine in amœbic dysentery differs very remarkably from that present in the other forms, and one has no difficulty whatever in diagnosing the amœbic from the other varieties of dysentery from the character of the ulcers alone. I shall not consider here the pathology of dysentery, as I have already covered the subject in a previous report and see no reason for changing any of my views regarding it.

Many of the cases which died of dysentery at this hospital gave a history of previous malarial infection, but only a small number showed any trace of such infection at autopsy. There have been a large number of cases of malaria treated at this hospital, but only one case that resulted fatally. The patient suffered from the quotidian estivo-autumnal infection and despite all treatment gradually passed into a comatose condition, which resulted in death. The autopsy findings in this case were so typical of the condition present in pernicious estivo-autumnal fever that I shall insert here the anatomical and microscopical reports.

A CASE OF PERNICIOUS QUOTIDIAN ESTIVO-AUTUMNAL FEVER, ILLUSTRATING ANATOMICAL AND MICROSCOPICAL CHANGES IN FATAL CASES.

R. G. C., teamster. Died, 4.30 a. m. July 21, 1900. Age, 52 years. Clinical diagnosis: Pernicious quotidian estivo-autumnal fever.

Body that of a man apparently 52 years of age, somewhat emaciated. Skin yellowish. Rigor mortis slight. Post-mortem discoloration over dependent portions of the body. Finger nails not congested. Pupils irregularly dilated.

Brain.—Dura mater appears normal. The amount of cerebro-spinal fluid is increased. The surface of the cerebrum is pale, and upon section the medullary portion appears hyperemic, and the cortex is slate colored. The lateral ventricles are filled with fluid. The choroid plexus is not congested. Upon section the cut surface of the cerebellum appears normal, save for congestion and slight pigmentation. Externally the blood vessels of the cerebrum are congested.

Thoracic and abdominal cavities.—The subcutaneous fat and muscular tissues are normal in amount. The pleural cavities are free from fluid. The liver reaches about 1 centimeter below the border of the last rib. The greater omentum contains a large amount of fat and reaches to a level with the umbilicus. The appendix is about 3 centimeters in length and lies in the right iliac fossa. It is normal in appearance. The bladder is dilated. The abdominal aorta shows no evidence of sclerosis. The suprarenal glands appear normal.

Liver.—The liver measures 28 by 21 centimeters. It is dark in color externally.

The gall bladder contains a large number of gall stones, and some inspissated bile. Upon section the cut surface of the organ is slate colored, and the lobules are ill defined. The organ is congested. Weight, 1,640 grams.

Spleen.—The spleen measures 19 by 12 centimeters. The organ is purplish black in color externally. The capsule is smooth. Upon section the cut surface appears almost black in color, with light areas scattered throughout it. The consistence of the organ is very much diminished, it being almost diffuent. Weight, 440 grams.

Pancreas.—The pancreas measures 22 by 4½ centimeters. Upon section the cut surface appears congested. Weight, 115 grams.

Left kidney.—The organ is pale in color. The capsule is smooth and slightly adherent. Upon section the cut surface is congested. The cortex and pyramids are distinct, and the cortex is normal in thickness. Weight, 125 grams.

Right kidney.—The organ is somewhat lobulated. The capsule is slightly adherent; otherwise it resembles the left. Weight, 125 grams.

Lungs.—The lungs are crepitant throughout and appear normal. The pericardial cavity contains about 30 cubic centimeters of clear straw-colored fluid.

Heart.—The amount of extracardial fat is increased. The vessels are congested. Upon section the ventricles contain small clots. The muscular walls are about normal in thickness. The valves of the heart are normal, with the exception of the middle segment of the pulmonary valve, which contains numerous small apertures.

Intestines.—The mucous membrane is congested; otherwise they are normal.

MICROSCOPICAL EXAMINATION.

Liver.—Sections of the liver show the pathological lesions of cloudy swelling and the changes found in pernicious malarial fever. The fibrous tissue in the portal spaces has slightly increased in amount, and there are large numbers of connective tissue cells present. All the blood vessels in the organ are increased in thickness. The liver cells are swollen, smoky, and granular in appearance, and in many of them the nucleus is present and shows necrotic changes, as evidenced by the pale stain and the granules of the chromatin, which are widely separated or are collected in small clumps. The protoplasm of the liver cells contains much fine yellowish pigment, which seems to be distributed only in the protoplasm, and not in the nucleus. The intralobular capillaries contain a great deal of black pigment, numerous large macrophages, and smaller mononuclear leucocytes. The pigment, which is free in the capillaries, is in the form of irregular blocks, and none of the yellow pigment which is present in the liver cells is seen in the capillaries. The large macrophages which crowd the capillaries contain within their protoplasm an immense amount of black pigment, evidently derived from broken-down malarial parasites. They also contain blood corpuscles containing parasites and free parasites of the estivo-autumnal variety. The number of parasites present is comparatively small, but the amount of pigment present is immense, and in clumps so large that many of the capillaries are occluded by it. This is especially noticeable in the capillaries near the portal spaces. On account of the small caliber of the interlobular capillaries the large macrophages are compressed and they appear often as large, slender, pigment-bearing cells. Some of these leucocytes are so large as to entirely block the capillaries. The malarial parasites present are small, round, or oval bodies, generally collected at the center. These are presegmenting parasites. No crescent forms were observed in the liver. The stellate cells of Kupfer contain black pigment and sometimes small parasites. In numerous places throughout the capillaries of the liver there are large bleb-like parasites containing pigment, which are evidently degenerating. The pigment in the macrophages is in the form of small, round blocks or larger irregular collections, and is dark brown or almost black in color. There is not a single capillary in the sections that does not show pigment-bearing cells.

Spleen.—Sections of the spleen show the changes characteristic of pernicious malarial fever. The Malpighian bodies are somewhat fibrous, and at their border there is an immense amount of yellowish-black pigment. The splenic pulp contains a small number of red corpuscles, which contain small round or oval estivo-autumnal parasites, which are pigmented. There is not the usual number of red corpuscles present in this spleen that we generally find in the spleens from cases of pernicious malaria. The splenic pulp also contains immense numbers of macrophages and large masses of free pigment. The macrophages are large white cells, which contain the following objects: (1) Large irregular collections of brownish-black pigment; (2) red corpuscles containing small round, pigmented estivo-autumnal parasites; (3) free estivo-autumnal parasites, most of them pigmented or showing signs of segmenting; (4) fine granules of yellowish pigment, which is entirely distinct from the black pigment present.

Some of the macrophages show all of these within their protoplasm, while others, and they are in the majority, show only one or two free parasites and irregular collections of pigment. As a rule these white cells are about six times the size of a blood corpuscle, but some of them are present which are very much larger. These very large cells entirely block the capillaries of the organ, thus hindering the circulation.

Besides the macrophages there are numerous mononuclear leucocytes and endothelial cells which do not take up the pigment of the parasites. The polymorphonuclear leucocytes are comparatively few in number. Everywhere throughout the sections there are very large masses of pigment situated in the spaces of the splenic pulp, often so large as to rupture them and cause an area of necrosis in which they are situated.

Throughout the spleen may be seen the crescentic forms of the quotidian estivo-autumnal parasite, but they are comparatively few in number. These crescents appear exactly as they do in the peripheral blood. In the spleen there are also numerous large bleb-like parasites like those seen in the liver, which contain much pigment and numerous vacuoles. These are evidently degenerating bodies. The segmenting forms of the parasite are remarkably few in number in the sections of the spleen, but many of the macrophages contain segmenting bodies.

Kidney.—Sections of the kidney show the pathological lesions of acute nephritis and the changes present in pernicious malaria. The Malpighian bodies are greatly congested, the capillaries being filled with blood and some of them have ruptured, thus causing hemorrhages within the tufts. Many of the capillaries contain small, free, round, or oval parasites, containing a small clump of pigment at their center. The capillaries also contain a few red cells which are infected by the parasites. There is present a small amount of free pigment. In the capillaries may be seen, now and then, a large bleb-like body, evidently a degenerated parasite, like those seen in the liver and spleen. The number of infected corpuscles and free parasites and the amount of pigment is very much smaller than in the case of the liver and spleen. No crescent forms were observed in the Malpighian bodies. The epithelium of the tubules is much swollen and is rapidly proliferating, while the protoplasm of the cells is smoky and finely granular in appearance, and contains, in many instances, pigment grains of a yellowish color.

One of the most interesting features of the kidney sections is the occurrence within many of the tubules of collections of black pigment and here and there a few parasites. There are few parasite-infected red blood corpuscles present in the tubules. The capillaries between the tubules contain numerous free parasites, round or oval in shape, and pigmented; also macrophages and infected red corpuscles. The macrophages, as in the liver and spleen, contain free pigment and parasites, and red corpuscles containing parasites or yellowish pigment. The walls of the capillaries are not thickened. It is especially noticeable how slight the amount of pigment is in the kidneys, as compared with the liver and spleen, and how few parasites are present.

Brain.—Sections of the brain show the pathological lesions of pernicious estivo-autumnal fever of comatose type. The changes observed in the sections of the brain may be divided into those occurring in the capillaries and those within the brain substance proper. The small capillaries of the brain, especially those of the cortex, are crowded with pigmented free parasites, leucocytes containing pigment, and in some places by small collections of yellow pigment. The infected capillaries are most numerous in the cortical portion of the brain, but they are by no means rare in the medullary portion. The pigment in the capillaries is generally collected in irregular masses, is brownish in color, and in some places entirely occludes the lumen of the capillary. This condition, which is very noticeable throughout the sections, no doubt accounts for the symptoms present referable to the brain. The parasites present in the capillaries are mostly free; are oval or circular in shape, small, and contain pigment which is generally collected near the center in the form of small grains or collections of grains. It is remarkable how uniform these parasites are in appearance, and how rarely is seen a red cell infected by parasites. It may be that during the preparation of the specimen the red cells become disintegrated, but this is hardly probable. In some places the capillaries are occluded by large white cells (macrophages), containing much pigment and numerous free parasites. Taken as a whole the pigment present in the brain is not large.

The changes occurring within the substance of the brain consist in a necrosis of the protoplasm of some of the cells, as is evidenced by the irregular staining of the protoplasm and nuclei.

Intestines.—Sections were not made of the stomach and intestines, as they presented no evidence of malarial infection.

During the year there have been three fatal cases at this hospital in which, before

death, numerous amœbæ, indistinguishable from those found in dysentery, were present in the feces, but in which at autopsy none of the pathological appearances typical of dysentery were present. Feces in these cases did not differ markedly from those common to amœbic dysentery, save that no blood was present in them. The amœbæ present occurred in great numbers and were perfectly typical of the amœbæ of dysentery. These cases conclusively prove that the amœbæ can be present in the intestine without producing any disease, as in all these cases the large intestine appeared normal, the only condition present being chronic enteritis and gastritis. While it can not be denied that in cases of amœbic dysentery the amœbæ produce typical lesions in the large intestine, it is a question in my mind whether they are the primary cause of the disease. From the conditions found in the cases just mentioned I would be inclined to regard the amœbæ as a secondary feature in the production of dysentery. Of course it may be possible that the individuals in which these amœbæ were found were peculiarly resistant to their action, or that some peculiar condition was present in the large intestine which prevented the amœbæ from obtaining a foothold. But even if we allow this argument it is one in favor of the amœbæ being a secondary feature, as, unless such conditions were present, it would remain harmless. I am satisfied, from my examinations of feces and the clinical symptoms, that the amœbæ are often present in the intestine without producing dysentery.

Regarding the preparation of microscopical sections from the cases which were autopsied, I would say that I have found it to be a most valuable routine procedure, as by so doing many changes were found to be present in the viscera which were not visible to the naked eye, and thus a more accurate and scientific diagnosis of the fatal cases arrived at. I have felt that, although it entails in the laboratory an immense amount of work, the results gained have more than paid for the trouble taken.

(F) MISCELLANEOUS EXAMINATIONS.

There have been 345 examinations which I have classed as miscellaneous. These have included special researches, examinations of cultures and smears from cases of suspected diphtheria, water and milk analyses, and examinations of urine and sputa for the officer in charge of the mustering out of United States Volunteers.

During the year, by direction of the commanding officer, I have sectioned the appendix in every case which has been operated upon by him, and a record has been kept of the pathological findings. Photomicrographs have been taken of a large number of sections, but, on account of inadequate apparatus for fine work in this direction, they have not been as satisfactory as could be desired. Cases of appendicitis operated upon, and of which sections were made, may be divided as follows, from a clinical standpoint: Acute appendicitis; recurrent appendicitis.

Every case operated upon at this hospital has shown some pathological change in the appendix, and from the standpoint of a pathologist they may be divided as follows: Catarrhal, obliterative, ulcerative, perforative, cystic.

The general pathology of appendicitis as shown by cases operated upon.—In describing the general pathology of appendicitis a brief review of the normal structure of the appendix is necessary. In its histological structure it resembles the large intestine, being composed of four coats, i. e., serous, muscular, submucous, and mucous.

The serous coat, or, more accurately speaking, the peritoneal, is the outermost coat, and is composed of a very thin layer of fibrous tissue, covered upon its outer surface by a layer of endothelial cells.

The muscular coat is composed of an external layer of longitudinal fibers and an internal layer of circular fibers. Normally the longitudinal layer of fibers is much thinner than the inner or circular layer, which is thick and strong.

The submucous coat normally is rather thin and composed of a very loose connective tissue which supports the blood vessels, lymphatics, and nerves. It also connects the circular muscular coat to the mucous coat.

The mucous coat, or mucosa, is the most interesting form from a pathological standpoint, as it is here that the first changes take place in disease of the appendix. It is devoid of villi and Peyer's patches, as is the large intestine generally, and consists of a base of adenoid tissue supporting a large number of simple tubular glands of Lieberkuhn. These glands rest upon a very narrow mucosa. The mucous layer also contains a large number of the so-called solitary glands or follicles.

Embedded in the adenoid tissue lie the tubular glands, each consisting of a delicate membrane, lined by a row of columnar epithelium, which is continuous with the lining of the mucous coat. The tubular glands in the appendix are much longer than the similar glands in the small intestine. The closed ends of these glands reach nearly to the muscularis mucosæ. The solitary glands or follicles are masses of adenoid tissue, generally oval in shape and filled with leucocytes. Their lower border

projects into the submucous layer while their apices lie in the mucous layer, being covered by the tubular glands and the epithelium lining the appendix. These glands are surrounded by lymphatics, and are quite numerous.

Lining the entire interior of the appendix is a delicate layer of epithelium continuous with that lining the glands of Lieberkuhn.

Having thus briefly considered the normal histology of the appendix, a better understanding is possible of the pathological changes which may occur in the various forms of appendicitis.

The pathological changes met with vary from those of a simple inflammation, with a limited invasion of the tissues by leucocytes, to pus formation, ulceration, and necrosis of the entire wall of the appendix in places, and consequently perforation. The specimens examined embrace all the stages mentioned, from the slightly inflamed appendix containing no pus to the necrosed and perforated appendix filled with purulent exudation. Of those examined eleven were diagnosed clinically as cases of recurrent appendicitis. Of these the appendix was examined microscopically in fifteen, sections being cut out and stained and photomicrographs prepared.

Taken as a whole the specimens sectioned may be divided as regards the pathological changes present into the following classes, i. e., catarrhal, obliterative, ulcerative, perforative, and cystic.

The catarrhal type.—This, the mildest type of appendicitis as regards the pathological changes present, is characterized by congestion of the mucous coat, infiltration of the mucous coat and submucous coat by leucocytes, and the production of more or less mucus within the appendicular canal. There were only two instances of this rapidity of the disease examined—the cases of C. A., private, Hospital Corps, United States Army, and Private J. C., Company H, Sixteenth United States Infantry.

In the latter case the lesions found were very typical, and essentially as follows: The adenoid tissue between the tubular glands was thickly infiltrated by leucocytes, in some places so much so as to compress the glands. Many of the glands were actively secreting mucous which bathed the surface of the glandular layer, having destroyed the delicate epithelium covering it. The appendicular canal contained much thick mucous. Large hemorrhagic areas have been formed in both the submucous and external muscular coats, due to rupture of the small capillaries in those regions brought about by their distension with blood. The submucous coat, besides containing these hemorrhagic areas, show some infiltration by leucocytes. A peculiar feature noticed was that some of the solitary follicles seem to have been replaced by hemorrhagic areas. The circular and longitudinal layers preserve their relative thickness and were not infiltrated by leucocytes. In this type of appendicitis the chief changes are found in the glandular layers of the mucous coat, consisting in an infiltration of the adenoid tissue by leucocytes, which has produced a large amount of mucus, together with the congestion of blood vessels of the entire appendix. The naked-eye appearance of the appendix in the cases of catarrhal inflammation is not very diagnostic. The appendix may seem to be a little or not at all inflamed externally, although there may be extensive catarrhal condition present.

In the case of A., the catarrhal inflammation had caused so much inflammation of the glandular layer by leucocytes as to obliterate a destruction of the glands. This condition is only present in cases which have suffered for some time with an attack, or from repeated attacks. It is not an ulceration, but the inflammation of leucocytes seem simply to occlude and cut off the glands. The condition of catarrhal inflammation will undoubtedly lead to repeated attacks, any of which may result in ulceration and perforation, if allowed to run their course.

The obliterative type.—This type of appendicitis was present in two of the cases examined, i. e., Lieutenant J. R., Sixth United States Cavalry, and Private E., Twenty-First United States Infantry. The pathological changes found in the obliterative appendicitis occurred only in those cases which had had more than one attack—that is, in recurrent appendicitis. Obliterative changes, however, do not occur in the majority of cases where, for some unknown reason, a reproductive instead of a destructive process results. The changes present consist essentially in the production of newly formed tissue in regions where it is normally present, as in the mucous layer. It is really a cirrhosis of the appendix, the mucous layer being crowded out, so to speak, by the newly formed connective tissue, which eventually entirely occludes the appendicular canal. The changes in the mucous coat consist in a great thickening and infiltration of it by numerous leucocytes, young connective tissue cells, and fibrils of connective tissue.

In the appendix of Lieutenant R. this condition is well illustrated. The canal of the appendix was entirely filled with new tissue, composed of fibers and multitudes of leucocytes and connective tissue cells. In some places this newly formed tissue had become vascular, small blood vessels having formed which supplied it with

nourishment. The glandular layer had entirely disappeared, no trace of the glandular structure being visible in any portion.

In the case of Private E. the entire canal was occluded with newly formed connective tissue, and in places large hemorrhagic areas had formed, evidently due to the rupture of the capillaries in the vicinity. The structure of the mucous coat in this case was entirely lost, save for a few isolated glands surrounded by much fibrous tissue. The submucous coat in cases of obliterative appendicitis is generally thickly infiltrated by leucocytes, much thickened and very fibrous. The muscular coats are somewhat thickened, especially the circular muscular coat, and are infiltrated by comparatively few leucocytes.

The result in cases of obliterative appendicitis, as shown by the pathological changes, would in most instances be necrosis and perforation. The newly formed connective tissue, unless amply supplied with blood, will degenerate and ultimately necrosis will take place. In a few instances obliterative changes may occur and the newly formed tissue be so well supplied with blood vessels that the result would be simply the shutting off of the appendix, which, provided that it take place at the extremity of the appendix, will not result in harm to the patient. If, however, the obliteration takes place at any other portion of the appendix, the closing up of the portion between it and the extremity will almost certainly result in ulceration and perforation after repeated attacks. The changes present in obliterative appendicitis is most noticeable in the mucous and submucous coats, and consists essentially in the rapid production of newly formed connective tissue which replaces the normal structure of the appendix.

The ulcerative type.—The ulcerative type of appendicitis was found in all the cases examined. This condition is simply a step in the process toward perforation, and while pathologically it presents certain definite features, which, it should be remembered, occur in either acute or chronic cases, and only shows that the process present is only destructive in character, the ulceration varies in extent. There may be but a slight ulceration of the mucous coat, or ulceration extending through the mucous and submucous coats, or ulceration extending through the peritoneal coat. In each the appearances presented are somewhat different in the structures which are affected. In cases where the ulceration extends only to the submucous coat the mucous layer may be intact, save in the ulcerative areas. In such areas the mucous membrane is destroyed down to the submucous coat, the walls of the ulceration being thickly infiltrated by leucocytes, as is also the mucous membrane where no ulceration has occurred. The submucous coat is generally very thickly infiltrated by leucocytes and the solitary follicles are swollen and densely packed with lymphoid cells. As a rule the internal muscular coat is thickly infiltrated by leucocytes, while the external one is generally not affected. This is the most simple and mildest type of appendicitis.

In cases where the ulceration is extended to the muscular coat, the mucous layer of the appendix is very likely to become much degenerated, owing to the extensive infiltration by leucocytes and the consequent pressure upon the tubule. The large areas of mucous membrane may show no glandular structure whatever, this result being due to necrosis. Where the ulceration has taken place the coats of the appendix are especially affected, being greatly infiltrated by leucocytes, the submucous and mucous coats often being indistinguishable from each other, the tubular glands having entirely disappeared and the hemorrhagic areas being present in both the submucous and mucous coats. The internal muscular coat is generally thickly infiltrated by leucocytes, very greatly thickened, sometimes being almost as thick as the normal thickness of the appendix. The mucous layer may be very greatly thickened, so much so as to almost close the appendicular canal. Where the ulceration is extended to the peritoneal coat, the appearances presented are essentially the same, save that the muscular coats are apt to be somewhat thin on account of the pressure of the exudation which is present in the canal. The result in such cases would eventually be perforation, as the amount of tissue involved and the severe character of the ulceration would lead invariably to the destruction of the entire wall of the appendix.

The perforative type.—The perforative type of appendicitis is, from a pathological standpoint, simply the culminating stage which is first evidenced by catarrhal inflammation. The simple catarrhal inflammation ends eventually in ulceration and the ulceration in perforation of the appendix. It is then simply the last step in the inflammatory process. The conditions present are similar to those found in ulcerative appendicitis, save that the ulceration has extended through the peritoneal coat. Very various are the pathological changes found in the appendix which has undergone perforation. The portion farthest away from the perforation, when sectioned, generally shows the catarrhal inflammation, and the nearer the perforation is approached the greater the ulceration present and the more extensive the destruction of the

various layers of the appendix. To describe them, the pathology of the appendix in cases where perforation has occurred would be but a repetition of the conditions already described, the only difference being that in the cases which are perforated the lesions are much more severe than in others. The mucous membrane may be entirely destroyed or it may be ulcerated in places. The submucous coat may be so thickly infiltrated by leucocytes as to be indistinguishable. The muscular coat may be thickened or thinner than the normal, or always greatly infiltrated by leucocytes, and in most instances this infiltration has caused a separation of the bundles of muscular fibers. To describe all the pathological changes found in the sections from the appendix would require a volume of needless repetition. The process is simply one of inflammation, acute or chronic, leading ultimately to destruction of the various coats of the appendix, the appearances presented varying with the tissues attacked and the rapidity or slowness of the inflammatory action.

The cystic type.—In one case a true cyst occupied the extremity of the appendix. This case gave a history of recurrent attacks. Microscopically, the extremity of the appendix was very greatly enlarged and filled with true cystic fluid, the cyst when opened measuring one-half centimeter in diameter. The condition found microscopically is described under the case of L. G., quartermaster employee, and will not be repeated here. This case is interesting as it shows the formation of a true cyst, with typical structure, after repeated attacks of inflammation. The cystic wall was typical in every respect. This cystic condition is of very rare occurrence.

In summing up the pathology of appendicitis as shown by these specimens, it will be seen how the process is generally a progressive one, and how dangerous the consequences are apt to be if the simplest catarrhal inflammation is allowed to continue for any length of time. As to the etiological factor concerning the production of the disease, it would appear that any irritant substance capable of exciting inflammation will be all that is needed for the production of an attack of appendicitis. It is undoubtedly due to the invasion of the tissue of the appendix by bacteria, notably the bacillus coli communis, which invasion is made possible by the destruction, in some way, of the guarding layer of epithelium. I can see, however, how a purely mechanical cause, such as a foreign body might, by continued irritation, cause an exudation, which, being confined in the small canal of the appendix, might, by compression, cause necrosis and perforation, without the aid of bacteria, but I believe that in the vast majority of cases the bacillus coli communis is the chief factor in the etiology of the disease.

Briefly stated, then, the pathology of appendicitis may be summed up as follows:

1. An injury to the delicate epithelium lining the interior of the appendix, and constituting its protective barrier.
2. The invasion of the mucous membrane and submucous tissue, rich in lymphatics and blood vessels, by bacteria, chiefly the bacillus coli communis.
3. The infiltration of these layers by leucocytes, which have rallied to repel the invasion, and consequently swelling of the mucous and submucous layers with some exudation.
4. The invasion of the muscular coat by bacteria and leucocytes, with the destruction of the mucous and submucous layers, and the formation of areas of necrosis and ulceration, due to pressure, impaired blood supply, and microbial poisons.
5. The entire destruction, in parts, of the mucous, submucous, muscular, and serous coats, and consequently perforation of the appendix.

As to the causal factor, that which produces the lesion in the epithelium, I believe that there is more than one. Any mechanical, chemical, or bacterial agency capable of injuring this delicate tissue, may be concerned. I do not believe that the primal cause is often bacterial, but after an injury has occurred I believe that the pathological changes which then begin are due to the invasion of the rich lymphatic tissue by bacteria, the chief of which is the bacillus coli communis.

Nuclein and malaria.—By direction of the commanding officer, I have conducted an investigation upon the influence of a preparation known as "nuclein," upon the parasites of malarial fever, as shown by the examination of the blood in certain cases in which it was administered. I have the records of 35 cases reported to me by the attending surgeon, in which the blood examinations were made every other day, and the effect of the medicine carefully noted. Of these 35 cases, 10 were infections with the tertian parasite, 2 with the quartan parasite, and 23 with the estivo-autumnal parasite. Of the whole number, 15 were treated with nuclein alone, and these will be reported upon first. Of these, 8 were infections with the tertian parasite, 2 with the quartan parasite, and 5 with the estivo-autumnal parasite.

Infections with the tertian parasite.—In the eight infections with the tertian parasite the remedy was entirely valueless in so far as preventing the paroxysm was concerned. The parasites remained as numerous in the blood as before the administration of the remedy, and the paroxysms occurred as usual.

Infections with the quartan parasite.—In the two cases infected with the quartan parasite nuclein was valueless. Paroxysms arrived promptly and were very severe. In one case the proof is very positive that the remedy is powerless in the intermittent malariae. This case showed the quartan parasites in the blood before any definite clinical symptoms were manifest. Nuclein was at once administered and the blood examined every day. Day by day the parasites became more numerous, until at last, several days after beginning treatment, the patient had a severe paroxysm. From this case it will be seen that not only is the remedy unable to prevent the paroxysms after they have once become established, but it is powerless to prevent a paroxysm when only a few parasites are found in the blood and no clinical symptom has as yet appeared.

Infections with the estivo-autumnal parasite.—In these cases the evidence as to the effect of nuclein is contradictory. In two of the cases—one showing numerous ring forms of the tertian estivo-autumnal parasites and numerous crescents, and the other ring forms and pigmented intracellular bodies—nuclein caused the disappearance of the parasites after three days' treatment. I can not say that the disappearance was due to other factors than the nuclein. In the three other cases nuclein had no effect whatever upon the parasites.

From these cases it would be seen that the remedy is probably of no specific therapeutic value in the malarial fevers.

Of the twenty cases in which nuclein was administered along with quinine, the effect of the drug is still in doubt. From the examinations of the blood, it was seen that a marked leucocytosis was produced during the first week of its administration, after which the leucocytes remained stationary. The clinical evidence is still more conflicting, as some of the surgeons that have used it claim that it had no beneficial effect, while others thought that it rendered recovery from malaria more complete and rapid.

There is no doubt that the nuclein does cause an increase in the number of the leucocytes, and that, when it is given, phagocytosis is more active, but this alone does not seem to be sufficient to cure the malarial fever. It is not reasonable to suppose that any remedy will so increase the phagocytes as to result in a recovery due to phagocytosis alone. Even in the most pernicious cases of estivo-autumnal malaria, phagocytosis is very active, more so than in the mild cases, which conclusively proves that it has little to do with the recovery from the disease.

From my observation I would conclude that nuclein is a valuable adjunct, along with quinine, in the treatment of the malarial fevers, but that of itself it is not able to effect a cure.

Observations upon the bacillus of Shiga in relation to dysentery.—I have continued my observations upon a bacillus separated from the intestine at autopsy of these cases of dysentery and it has proven to be the same as that discovered by Shiga in Japan and studied very carefully by Flexner and Strong in Manila. This bacillus has proven to be the cause of the acute specific dysentery prevalent in Japan and the Philippines. Cultural peculiarities and the morphology of the organism has been so fully described by the observers quoted that I shall not enter into a description here. I have devoted the most of my attention to the agglutination test and to the effect of the bacillus upon animals. As regards the latter I may say that the results have been so contradictory that I have been unable to draw any positive conclusion from them.

It has been found that this bacillus, which much resembles that of typhoid, will agglutinate when placed in the blood serum of a patient suffering from certain forms of dysentery, designated as an acute specific dysentery.

Using the same method as is used for the Widal test and substituting this bacillus, I have tested the blood serum of 70 cases of dysentery. In making the test I have used a dilution of 1 to 10 and have allowed a time limit of fifteen minutes. The cases tested were all diagnosed as chronic dysentery, and of the 70 cases 20 of them showed the amœbæ in the faeces and were therefore amœbic dysentery. The results of the tests were as follows:

1. Of the 20 amœbic cases only 1 gave a reaction, which was very slight. This case came to autopsy and was found to be a typical case of amœbic dysentery. It was impossible to ascertain whether or not the patient had previously had an attack of the specific variety.

2. Of the 50 remaining cases 21 gave a positive reaction and 29 negative. Of the positive cases 5 came to autopsy, and the pathological conditions present were those of severe diphtheritic dysentery, the ulcerations being very superficial in character and the entire large intestine covered with a thin necrotic membrane covering in the ulcerations. I am satisfied that these cases were the chronic form of the acute specific dysentery observed in the Philippines.

3. Of the 29 negative cases only 2 came to autopsy, and they were both of the gangrenous type of dysentery.

As a result of these examinations I am inclined to believe that the agglutinated test of Shiga's bacillus is comparable in accuracy with the Widal test. Perhaps this conclusion is a little premature, but the fact that the bacillus does not react in the cases of amebic dysentery is very significant. I believe, however, that investigations of this test in the acute cases would be more satisfactory.

Large numbers of cultures and smears have been made from cases of suspected diphtheria, but only 1 case proved positive.

Analyses have been made of milk supplied to this hospital, which was found as a rule to be in a satisfactory condition.

(G) AUTOPSIES.

The number of autopsies and the cause of death in the cases autopsied has already been referred to in a section of this report treating of the examinations of post-mortem material.

In conclusion, I have the honor to state that the laboratory is excellently equipped and the apparatus is in good condition.

X-RAY LABORATORY.

During the year a large amount of work has been done in the X-ray laboratory consisting of fluoroscopic examinations and the taking of radiographs. The work has been done with a static machine which has proved very satisfactory, the one objection to it being the tendency of slight moisture to discharge the machine. This, however, has not affected its utility during the last six months. Besides the use of the static machine for radiographic purposes, it has also been used in the treatment, by electricity, of certain nervous diseases and myalgia.

The exact number of fluoroscopic examinations made has not been recorded, but will range somewhere between 125 and 150. These examinations have proven of great value in locating bullets, which were afterwards removed by operation; in detecting the amount of injury to the bone from gunshot wounds, and in the treatment of fractures.

During the six months ending June 30, 1901, there were 25 fluoroscopic examinations made to ascertain if the bone had been injured or a bullet remained in the tissues in certain cases, all of which resulted negatively. These examinations are of interest as showing how easy it is in such cases to ascertain by the X-ray the condition present and how difficult it is clinically, in many instances, to make a diagnosis. These negative examinations were divided as follows:

Suspected fractures	10
Suspected luxations	2
Suspected aneurism of the arch of the aorta	1
Gunshot wound (to ascertain if bullet remained)	12

The total number of radiographs made since January 1, 1901, has been 92. These are divided as follows:

Gunshot wound of—	
Chest	6
Shoulder	4
Arm	4
Elbow	3
Forearm	4
Hand	6
Pelvis	3
Hip	7
Thigh	7
Knee	3
Leg	5
Foot	4
Fracture of—	
Phalanges of hand	5
Humerus	2
Femur	1
Patella	1
Tibia and fibula	6
Clavicle	1
Inferior maxilla	1
Miscellaneous	13
Total	82

A copy of these radiographs will be submitted very shortly.

The total number of patients examined in the X-ray clinic since January 1, 1901, has been 117, divided as follows:

Regulars.....	47
Volunteers.....	65
Civilians.....	5
Total.....	117

The X-ray laboratory and electrical department are equipped with a Morton-Wimshurst-Holtz ten-plate static machine with full set of electrodes, one-fifth horse-power motor, Cleaves current controller, Cyrus Edison's ozone inhaler, Monell's interrupters, Crookes' tubes, fluoroscopes with barium-platino-cyanide screens, and complete equipment for radiograph work. This work has been much improved by better facilities in the photographic department. A commodious dark room was built, fitted with sinks, water supply, and electric connections. A 15-inch burnisher and a 26-inch print trimmer, with trays, printing frames, and other necessities have been added to the outfit.

It has been found that it is necessary to have an experienced operator to obtain the best results in radiographic work, no matter what kind of a machine is used and what methods are used in completing the photographic process. The following are the principal points to be taken into consideration in the production of good radiographs:

- (a) Current generated and uniformity of same.
- (b) Kind of tube used and state of vacuum.
- (c) Region of the body to be radiographed and thickness of individual.
- (d) Distance of tube from the body.
- (e) Sensitiveness of the plate.

After exposure the process is comparatively simple, although some developers give better definition than others and the paper used for printing should be carefully selected. At this hospital the metol-pyro solution has been found to be the best developer and the solio paper has given the best satisfaction for printing purposes.

REPORT UPON INSANITY.

There have been 180 cases diagnosed as insane received at this hospital during the fiscal year. These cases have been cared for in the insanity ward, a small detached building on the eastern portion of the hospital grounds, which is well equipped for the care of such cases. Several times during the year the capacity of this small ward was exceeded and a few cases were cared for in the auxiliary wooden barracks. The ward for the care of the insane patients is in charge of a medical officer, who is assisted by two privates of the hospital corps. The patients are kept under observation at this hospital until a board, composed of three medical officers, is satisfied as to their condition, when those who are considered to be insane are sent to the Government Hospital for the Insane, at Washington, D. C., while those considered to be normal mentally are returned to duty or discharged as the case may be. A considerable number of soldiers returning to this country from the Philippines and diagnosed as insane, are found, upon arrival here, to be normal as regards their mental condition and are returned to duty, or, in the case of volunteers, discharged from the service.

The 180 cases diagnosed as insane received at this hospital during the year were divided as follows:

Regulars.....	96
Volunteers.....	78
Discharged soldiers.....	2
Prisoners.....	2
Civilians.....	2
Total.....	180

The following dispositions were made in these cases:

Transferred to Government Hospital for Insane, Washington, D. C.....	128
Returned to duty.....	34
Discharged on surgeon's certificate of disability.....	7
Discharged from the hospital.....	3
Mustered out with regiment.....	3

Transferred to Alcatraz Prison	1
Transferred to City Hospital, San Francisco, Cal	1
Died	2
Remaining in hospital for observation	1

Total 180

Diagnosis.—It has been exceedingly difficult in many instances to determine the exact form of insanity present in many of the cases, and it has been only after careful study and observation that the diagnosis could be determined. The 180 cases were divided as follows:

Acute melancholia	39
Melancholia simplex	11
Chronic melancholia	16
Acute or primary dementia	14
Secondary or terminal dementia	7
Primary delusional insanity	6
Chronic delusional insanity or paranoia	3
Alternating or circulating insanity	1
Acute mania	28
General paralysis of the insane	1
Epileptic insanity	1
Syphilitic insanity	1
Traumatic insanity	1
Morphomania	1
Monomania	2
Epilepsy (grand mal)	1
Nocturnal epilepsy	1
Insanity not confirmed	46

Total 180

During the year there have been 46 cases, diagnosed as insane received at this hospital in which the diagnosis was not confirmed. It is probably true that most of these cases, if not all, were insane at the time that they were transferred to this hospital, but the majority of them came from the Philippine Islands, and the voyage home, together with a more cheerful surrounding, resulted in the disappearance of the abnormal mental condition. Most of these cases were of the type of insanity in which the prognosis is good, and most of them were, without doubt, due to nostalgia and the depressing influence of campaigning in the tropics. Upon removal of this condition the return to the normal mental condition was rapid and complete. The diagnoses of the cases of insanity which were not confirmed were as follows:

Acute melancholia	15
Melancholia simplex	3
Chronic melancholia	1
Acute mania	4
Delusional insanity	1
Nostalgia	1
Neurasthenia	2
Chronic cephalalgia	2
Acute alcoholism	7
Chronic alcoholism	3
For observation	6

Total 46

Etiology.—The etiology of insanity in soldiers returned from the Philippine Islands is a subject which is at one simple and complex. Without doubt a large proportion of the cases which become insane have a hereditary taint which had not been discovered prior to enlistment. This, taken with the long distance from home, the intense heat of the tropical sun, constant harassment by an enemy which it is impossible to see, excessive use of alcoholics, and the depressing influences always present in a tropical climate, will account for the changed mental condition.

The influences just spoken of, even without the hereditary predisposition, are enough to produce, in a highly nervous individual, mild or even severe forms of insanity. It is safe to say, however, that the proportion of insanity in the Army does not exceed that in civil life in any large city, where the conditions of life approach the conditions found in the Philippines as regards social surroundings, etc.

It has also been found that the ratio of recovery in the case of soldiers returning from the Philippine Islands is much larger than that found in a corresponding number of individuals taken from civil life, and this goes simply to prove that the condition of insanity present has been only a temporary one, which rapidly disappeared upon transference to other conditions more favorable to the individual. Almost all of the cases of melancholia will be found upon examination to be due to nostalgia, and as a rule in these cases the prognosis is very favorable, provided the patient is transferred to the United States. It would be uninteresting and of no value to consider the etiology of the different forms of insanity present in soldiers, for all of them will be found upon examination to be due to one or more of the causes mentioned above.

THE FIRE.

Upon the afternoon of June 10, 1901, the northeastern portion of the hospital was destroyed by a fire which originated in the carpenter shop. One of the civilian employees of the hospital, without authority, was boiling paraffin over an oil stove, when it ignited, and before anything could be done the flames had spread to the inflammable material in the carpenter shop and to that portion of the hospital. The portion destroyed by fire included the patients' and hospital corps' dining rooms and kitchens; the medical, ordnance, quartermaster, and baggage storerooms; the carpenter and paint shops; ward F and a portion of ward G, with the tent hospital of forty-five tents. This fire involved a loss to the hospital of approximately \$56,000. Since the fire a portion of ward G, which was partially destroyed, has been repaired and the fences on the north and east sides of the hospital, which were either torn down or burned, have been replaced. Ward H has been refitted as a patients' kitchen and dining room, two ranges having been set up and the chimney in the ward altered. A temporary stairway has been built in the front of this ward for use in taking supplies from the storerooms to the kitchen. A short time after the fire wards I and J, which were slightly damaged and emptied in order to save their contents, were refitted and made ready for occupancy.

At the time of the fire a strong wind from the southwest was blowing and the flames spread with the utmost rapidity, and although the fire was fought by the fire brigades of the hospital, the post, and the city, it was impossible to save the northeast portion of the hospital.

The losses to the general hospital by fire were as follows:

Buildings.....	\$35,000.00
Medical property.....	14,991.52
Medical property to be inspected and condemned.....	3,173.02
Quartermaster property.....	5,597.16
Ordnance and ordnance stores.....	1,251.77

MEDICAL OFFICERS.

During the year 103 medical officers reported to this hospital for duty. Most of these officers were detailed on temporary duty while en route to the Philippine Islands. The following dispositions were made:

Transferred.....	96
Discharged the service.....	1
Sick.....	6
Temporary duty, awaiting transportation to the Philippine Islands.....	86

There have been 10 medical officers at this hospital during the year on permanent duty:

Regulars.....	3
Contract surgeons.....	7

POST-OFFICE.

Connected with the hospital is a branch post-office known as Station No. 1, Presidio. This office has proved of great convenience to the inmates of the hospital and has handled an immense amount of work during the year. The following tabulated statement of the money-order business from August, 1899, to July 25, 1901, published



ARMY GENERAL HOSPITAL, PRESIDIO OF SAN FRANCISCO, CAL., ON FIRE, JUNE 10, 1901.

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by permission of the post-office inspectors, will give some idea of the large amount of business done at this office:

1899:		1900:	
August	\$674. 00	November	\$1, 112. 00
September	1, 959. 00	December	1, 270. 00
October	3, 033. 00	1901:	
November	2, 165. 00	January	972. 00
December	1, 834. 00	February	2, 161. 00
1900:		March	1, 801. 00
January	1, 564. 00	April	5, 118. 00
February	1, 355. 00	May	11, 189. 00
March	2, 323. 00	June	17, 849. 00
April	873. 00	July	13, 255. 00
May	775. 00		
June	2, 081. 00	Total	83, 185. 00
July	1, 228. 00	Money orders paid and repaid.	1, 230. 50
August	1, 698. 00		
September	5, 708. 00	Total	84, 415. 50
October	1, 188. 00		

In this period 2,525 money orders have been issued.

CONCLUSION.

In concluding this report, in which, owing to my performing the duties of chief surgeon of the department in addition to the administration of the hospital and its operative surgery, I have had to rely greatly on the reports of the medical officers in charge of the various departments, I desire to draw attention to the great harmony existing at the hospital during the year, medical officers, hospital corps, and female nurses vying with one another in making the institution the perfection of its kind. I am greatly indebted to Dr. Craig for the compilation of the data furnished, but particularly for his devoted and painstaking work in the bacteriological laboratory and at the post-mortem table, of which his report is a plain evidence. I have facilitated his work in every possible manner, principally by supplying him with a stenographer, which did away with the drudgery of writing.

Lieut. C. C. Collins, assistant surgeon, United States Army, has very intelligently filled the multiple offices of the executive, quartermaster, commissary, ordnance officer, and summary court, and deserves an ample share in the credit for the smooth working of the hospital. Capt. W. E. Purviance, assistant surgeon, was not selected by me as executive officer, because I needed his services in the supervision of the medical work of the wards, the examination of clinical histories, and consultation in medical cases. In addition to these I charged him with the presidency of the various boards for discharge, disposition of insane, etc., and he has had prepared under his supervision the final statements and discharges, as well as the certificates of disability, all of which required an officer of experience.

Lieutenant Hess, assistant surgeon, during his stay at this hospital, was a valuable assistant to Captain Purviance, and had in addition the charge of the voluminous muster rolls and clothing and descriptive books.

Dr. Clark, who had charge of the surgical wards, was of great value in his good judgment and in his correct enforcement of antiseptis, to which I owe the remarkable results obtained in surgery at this hospital.

Dr. William P. Banta has during the greater part of the year had charge of the X-ray apparatus and photographic work, and has made such improvements in equipment and its use that the radiographs produced in this laboratory are equal to any I have ever seen. Dr. Banta combined with this work the eye, ear, nose, and throat clinic, for which special facilities have been provided, and also the care and final disposition of the insane.

The other medical officers, Lieutenant Morse, Medical Department, Contract Surgeons McVean, Murtagh (now in the regular service), White, Barry, and Guitard, were more directly engaged in the service of the medical wards, and proved very zealous and satisfactory.

It would have been an impossibility to accomplish the great task of receiving in a hospital calculated to take care of 400 patients during a year over 5,000, feed, treat, and dispose of them according to the army system without devoted and intelligent assistants.

ARMY HOSPITAL SHIPS.

At the present time we have no army hospital ship. The *Relief* was used during the past year for service in the Philippine waters, but her great draft of water, which prevented her from entering many of the harbors and necessitated the transfer of sick for several miles in open boats, resulted in her transfer July 25, 1901, to the quartermaster's department as unsuited for special medical service.

An experiment was made in utilizing an army transport, the *Pennsylvania*, for the purpose of bringing sick men to Manila from outlying posts. This vessel left Manila October 5, 1900, with subsistence and quartermaster supplies for various southern garrisons and with accommodations for the return of 160 sick or wounded men. The hospital on the main deck consisted of four wards of 40 beds each, with dispensary, office, surgical dressing room, etc. Everything necessary for the welfare, convenience, and comfort of the sick was promptly furnished by the medical supply depot at Manila. This extemporized hospital ship brought back 155 cases to Manila on November 11, after a voyage of 2,322 miles. Among the cases were 46 of dysentery, 19 of malarial fever, 13 of diarrhea, 13 of wounds, and 6 of insanity. In every case there was marked improvement, a large proportion of the sick men being practically well by the time the vessel reached Manila, and no death occurred. It was deemed worthy of remark by the commanding surgeon, Maj. John S. Kulp, surgeon, United States Volunteers, that even the cases of insanity with no other treatment than generous food, illustrated papers, light airy surroundings, and constant companionship, improved so rapidly that any special guard over them seemed unnecessary before the end of the voyage.

The great objection to this ship was her draft of water, which prevented her from entering harbors and rendered difficult the transfer of sick from shore to ship.

The success of this voyage, notwithstanding unsatisfactory conditions and the prior successful use of the *Relief* for a similar purpose, originated the idea of making use of the supply trips of the latter vessel in giving the benefits of a sea voyage to invalids in the Manila hospitals who evidently were not improving by their hospital treatment. On the first trip of this character the *Relief* left Manila March 31, 1901, with 140 invalids. Fifty-one were collected on the trip. A careful examination on the return to Manila showed 29 returned to duty, 100 markedly benefited, and 60 somewhat better, but with no decided improvement. The change of air and food, the cool nights, and constant change of scenery had a decided effect for good on the majority of these cases. On several such voyages since then the *Relief* has been of material benefit to the sick, but always under the great disadvantage of her inability to come close to shore. These voyages demonstrated that a suitable light-draft ship devoted solely to the interests of the medical department is a necessity. Authority was therefore received from the Secretary of War for the purchase of a ship as a hospital transport, and measures are now on foot to accomplish this object, which will satisfactorily solve the questions of furnishing the departmental and district military hospitals in the Division of the Philippines with medical supplies, and of promptly removing such sick and wounded men as require transportation to Manila.

In a similar way daily outings have been given to convalescents

from the Manila hospitals on the Pasig River and Laguna de Bay on the hospital launch *New York*, which carries conveniently about 50 persons. A regular roster from her dock has been established, and each hospital in turn sends its quota of doctors, female nurses, and patients on successive days, the trip occupying three to four hours. The results have been very gratifying, even this little outing going a long way to relieve the tedium of the necessary confinement in hospital and hastening convalescence in many cases.

HEALTH OF THE ARMY.

The health of the Army must be regarded as having been unusually good during the calendar year 1900, the medical statistics of which are tabulated in the present report. To give a proper valuation to this statement the statistics of our Army from the time of the civil war must be taken into consideration. For many years after that war the admissions to sick report, discharges for disability, and deaths were somewhat similar to those reported during the past year, but then they were the result of service in the garrisons of the United States, while now they result from what practically has been war service in the Philippine Islands. Sanitary improvements in the condition of the soldier gradually lessened the rates, year after year subsequent to the civil war, among the troops in the United States, until in 1894 the admission rate from all causes fell to 1089.73 per thousand of strength. The lowest admission rate for disease was 830.65 in the year 1896; the lowest death rate from all causes was 5.11 per thousand of strength, 3.14 having been the rate for disease, both of which were recorded in the year 1897—the year preceding the great change in the sanitary environment of the soldier which resulted from the outbreak of the Spanish-American war. Following that outbreak, we had heavy rates of sickness and mortality, due to the exposures of active service in Cuba, Porto Rico, and the Philippine Islands. For a short time these rates were in excess of those of the civil war when at their worst, but the sanitary knowledge of the present time, put to energetic practical use, speedily caused a cessation of these excessive war rates, leaving the ratios still as high as those which prevailed in the garrisons of the United States for a number of years after the close of the civil war.

The increase in the ratios of admissions to sick report, discharges, and deaths during the past year over those of the years 1894–1897 is due to the relatively large proportion of our military force which served under war conditions in the Philippine Islands and China. But for this, the rates given by the Army would have made a very satisfactory record, as those given by troops serving in Cuba, Porto Rico, and the United States were by no means heavy.

The admission rate for all causes in the Army, volunteers and regulars, with a mean strength of 100,389 in 1900, was 2311.81 per thousand of strength, as compared with 2178.06 in the previous year; but during the year 1899 only 39,280 men out of a total of 105,546 were serving in the Philippines, while during the past year 66,882 of a total of 100,389 were thus serving. This is an important point to remember in considering the sick rates of the two years.

The troops serving in the United States during the year 1900 (mean strength 20,690) had an admission rate of 1510.97 per thousand of strength, as compared with 1677.51 during the previous year—1242.87

from disease and 268.10 from injury, as compared with 1496.84 and 180.67, respectively, during 1899. The ratio for discharge was 39.29 per thousand of strength, as compared with 26.95 during the previous year; 32.52 of this rate was for disease and 6.77 for injury. The death rate did not differ much from that of the previous year. It was 7.78 from all causes per thousand of strength, as compared with 7.89 in the previous year; 4.83 from disease, as compared with 6.56 and 2.95 from injury, as compared with 1.33.

In the Philippine Islands, with a mean strength of 66,882, the admission rate was 2621.96, as compared with 2395.52 in the previous year, this increase being mainly due to disease among the volunteers, the ratio for which rose from 1859.21 to 2761.79. The regulars, on the other hand, showed a marked decrease in the ratio of admissions for disease, which fell from 2454.10 to 2197.73. Two-thirds of the admissions for disease were caused by malarial fevers and diarrheal diseases. The discharge rate among the volunteers, 12.98 per thousand of strength, was smaller than that of the regulars—22.46—probably because the volunteers were in expectation of a return home for muster out at an early date. The deaths from all causes amounted to 28.75 per thousand of strength, as compared with 30.58 in the previous year. Disease occasioned 20.26 deaths, the principal cause of the fatalities being dysentery, which, with other intestinal diseases, gave a rate of 9.08. The rate from injury amounted to 8.49.

The death rate in China was large, 47.76 per thousand of strength, 23.62 from disease, and 24.14 from injury, but fortunately the mean strength for the year was small, 1,947 men.

From the close of the calendar year 1900 to the latest reports, the health of the troops in the Philippines has been steadily improving. The chief surgeon has reported a progressive diminution in the non-efficiency of the command from disease and injury. In July and August, 1900, the non-efficiency constituted 9.47 and 9.58 per cent of the strength. From January to June, 1901, the non-efficiency was less than 7 per cent, the lowest rate 6.12 per cent, having been recorded in March. Intestinal and gastric diseases, including dysentery and typhoid fever, gave 34.22 per cent of the total sickness, malarial fevers 15.23 per cent, and venereal diseases 13.10 per cent. Typhoid fever, which scourged our camps in 1898, appeared only sporadically, constituting merely 1.78 per cent of the total sickness. Most of the malarial cases were mild and made little or no figure in the mortality returns. Smallpox, so prevalent and deadly in the early occupation of the islands, has almost entirely been suppressed. Dysentery, constituting 13.44 per cent of all cases of sickness, is the dangerous disease. Bubonic plague, although a subject of importance to the medical officers, members of the board of health of Manila, and to those temporarily assigned for duty with the board as inspectors, on account of its prevalence among Chinese and Filipinos, appears to have given but little anxiety to medical officers serving with troops, as during the year only one case was reported as having occurred in the army in the person of an enlisted Chinese cook of the Twenty-seventh Infantry at Camp Stotsenberg, near Manila, the infection having undoubtedly been contracted in the city. Quarantine and disinfection prevented any extension of the disease.

The health of the troops serving in Cuba was excellent during the year. With a mean strength of 8,690 the admission rate was 1873.07

as compared with 2749.74 in 1899, the rate for disease having been 1586.19 as compared with 2537.98. Discharges for disability amounted to 16.57 per thousand of strength as against 20.25 during the previous year and the death rate from all causes was 9.78 as against 18.30 in 1899. Malarial diseases contributed 581.35 to the admission rate, but the death rate from these cases was only 1.04 per thousand of strength. Dysentery and diarrheal diseases constituted 166.75 of the admission rate, but only 0.58 of the death rate. But for the occurrence of yellow fever the death rate from the disease in this command would have been only 4.72 per thousand of strength. One hundred and forty-four cases were reported, of which 32 were fatal, giving a death rate of 3.68 per thousand of strength, the rate for all diseases being 8.40 and for all diseases and injuries 9.78. Since the close of the calendar year the health of the troops has continued good. Under date of July 22, 1901, the chief surgeon reported that since November, 1900, the only cases of yellow fever that had occurred in our military garrisons were the nine cases in the persons of men who were experimentally inoculated by infected mosquitoes at Quemados. See page 715.

Maj. V. Havard, surgeon, United States Army, chief surgeon, Department of Cuba, makes note of the fact that the admission rate for disease in the garrisons of the eastern half of the island of Cuba is nearly double that of the troops serving in the western half. This is due to the greater prevalence of malarial fevers and diarrheal diseases in the eastern provinces. See page 683.

As a result of the American occupation of the island every city has its health officer and every inland town where troops are stationed has had its sanitary condition more or less improved by the energy of the post commander and medical officer, the latter acting as a sanitary inspector for the municipality.

In Havana the work of sanitation has been prosecuted with vigor by Maj. W. C. Gorgas, surgeon, United States Army, the chief sanitary officer. His systematic efforts to destroy mosquitoes, which are now recognized to be the chief agents in the propagation of malarial and yellow fevers, have achieved the most gratifying results. During the first six months of 1900 the mortality from malarial fever was 247; during the last six months, 97, and during the first six months of 1901 only 75. As to yellow fever, there were 24 deaths in the city during the first six months of 1900, 285 in the last six months, 17 in the first three months of 1901, and none in the three months ending June 30, 1901, during which the machinery of the health department for the control of the disease under our recently discovered knowledge as to its propagation became perfected. Any further improvement in the sanitation of the city must depend on an approved sewerage system and on the gradual improvement of the local sanitary conditions.

The medical record of the troops in Porto Rico for the year 1900 is an excellent one, comparing favorably with that of the troops serving at the home stations. With a mean strength of 2,180 for the year, the admission rate for all causes of disability was 1,577.98, as compared with 2,522.40 during the previous year. The rate for disease was 1,397.71 and for injury 180.27, as compared, respectively, with 2,255.97 and 266.43 in 1899. The discharges for disability amounted to 15.14 per thousand of strength, compared with 19.85 in the previous year. These discharges were mainly for consumption and diarrheal diseases. The death rate was only 5.05 per thousand of strength,

as against 11.27 in 1899. All the deaths were the result of disease. It will be observed that this death rate is lower than the lowest recorded death rate in our Army—5.11 per thousand in 1897 in the carefully supervised garrisons of the United States prior to the sanitary change made by the outbreak of the Spanish-American war. Venereal diseases caused 867.88 of the admissions per thousand of strength. Were these deducted the admission rate for disease would fall to 1,029.83. Malarial diseases had an admission rate of 247.25 and diarrheal diseases 148.17 per thousand of the strength.

Special attention has been paid by medical officers during the year to the purity of the water supplies used by their commands. As a rule all doubtful supplies have been boiled before use for drinking. Orders and circulars have been issued by post and company commanders concerning the danger from typhoid fever, dysentery, intestinal parasites, and other abdominal diseases by the use of impure surface water. In the Philippines the Waterhouse-Forbes sterilizers described in my report for the year ended June 30, 1899, pages 215-225, are in use throughout the islands and give the utmost satisfaction, although care in their management must be taken to insure a thorough sterilization. With troops new to the islands the utmost care on the part of officers is necessary to prevent dangerous results from the use of impure water.

The following letter, dated May 22, 1901, from Brig. Gen. A. W. Greely, chief signal officer, United States Army, to the Adjutant-General of the Army, shows that service in the Division of the Philippines does not involve a large nonefficiency from sickness if the men are intelligent and take care of themselves:

SIR: As a matter of official interest to the Secretary of War, the Commissary-General of Subsistence, and the Surgeon-General, I have the honor to state that the official reports of Lieut. Col. James Allen, chief signal officer, Division of the Philippines, show that at the end of February, 1901, there were serving in the Philippines 31 officers and 517 enlisted men of the Signal Corps, of whom there were reported sick no officers and 7 enlisted men.

It may be added that the duties of the enlisted men of the Signal Corps are such as to cause them to serve at widely separated posts under adverse conditions.

First Lieut. Leonard D. Wildman, commanding Company H, who reports only 1 man sick out of an aggregate of 113, says: "The health of the command is unusually good. * * * It is largely due to the care the men take of themselves and the fact that the ration, supplemented by native vegetables, is a very wholesome one. Nearly every man in the company has had his turn at line work in the field or as signalman with some expedition. The variety of work is also accountable in a measure for their health. A few men, however, have broken down and have been brought to the headquarters and given lighter work and more exercise. The operators, who are on duty twenty-four hours per day, are the first to give way. Men who have the hardest work and most exercise seem to be well."

This surprising condition of health is practical evidence of the efficiency of the commissary and medical departments when supplemented by the supervision of a careful commanding officer. It is a record of the condition of military affairs in the Philippines, of special interest at this time, when many unwarranted adverse criticisms of the Army are being made.

REPORT OF COL. CHARLES R. GREENLEAF, ASSISTANT SURGEON-GENERAL, UNITED STATES ARMY, CHIEF SURGEON DIVISION OF THE PHILIPPINES, MANILA, P. I., MAY 31, 1901.

I have the honor, prior to my departure for the United States, to submit a report of the operations of the medical department in the Division of the Philippines for the period ending May 31, 1901:

HEALTH OF THE ARMY.

The health of the troops continues to be good, and the ratio of noneffectives to the whole strength has still further diminished. The average for the seven months covered by my last report was 8.84 per cent; for nine months ending March 31 the

average is 7.52 per cent; the month of August gives the highest, 9.47 per cent, and March the lowest, 6.12 per cent. As the reports of sick and wounded for April are not all in at the time this report is made, accurate statistics are not available for that month and for May.

Aggregate numerical sick report, by months.

	Strength.	Noneffective.	Per cent.
1900.			
July	61,392	5,811	9.47
August	60,702	5,817	9.58
September	64,226	5,451	8.49
October	67,866	4,977	7.33
November	68,436	4,937	7.21
December	68,465	4,682	6.84
1901.			
January	68,043	4,297	6.37
February	63,127	4,077	6.46
March	56,791	3,478	6.12
Average			7.52

The principal diseases for the same period give the following rates:

Disease.	Average per cent of total sick for period.	Maximum monthly.	Minimum monthly.
Typhoid fever	1.78	2.23	1.25
Malarial fever	15.23	21.45	10.48
Dysentery	13.44	15.96	11.92
Diarrhea	12.85	19.01	6.91
Other intestinal	2.63	4.43	1.46
Gastric	3.54	4.96	2.26
Wounds and injuries	10.31	12.12	7.68
Venereal	13.18	20.42	8.97

Intestinal and gastric diseases, including dysentery and typhoid fever, therefore give 34.22 per cent of total sickness; malarial fever and sequelae next with 15.23 per cent, and venereal diseases third with 13.18 per cent.

The great improvement in the effective rate to total strength is to a certain extent, no doubt, due to still greater care in sanitation, but the greatest factor is that the regiments have been gradually weeded of their weaklings and chronic invalids. The immature youths, the hard drinkers, and the recruits with inherited or acquired weakness of constitution, have gradually, after repeated appearance on the sick report, and running the circuit of various hospitals, been sent to the United States. Service in the Philippines shows on a grand scale the operation of the law of the survival of the fittest, and the volunteer troops give us the best example of this, because they have received no recruits since their arrival in the islands. The seasoned men who pass a year in the Tropics, of strong constitution, observing the ordinary hygienic rules, and old enough to be moderate in their appetites, should show a small sick rate were it not for two adverse factors.

The first is the inevitable undermining of the strength of the most robust by continued service in the Tropics, and the second is the increasing prevalence of venereal diseases.

The most energetic and stalwart American after a year of service here loses energy, strength, and ambition. He performs what work his duty demands more or less half-heartedly and with a draft on his vital energy that he can actually feel at the time. Slight ailments, to which a second thought would not be given in the United States, are felt out of all proportion to their severity. The most valuable work of the medical officer with troops in camps and garrisons consists of judiciously advising and treating this class of cases—the slight ailments of men who do, or are striving to do, their full duty and who honestly dislike their names to appear on the sick list.

Typhoid fever has not existed as an epidemic anywhere. A few sporadic cases occurred from time to time at different places, and do not appear to have been occasioned by neglect on the part of medical or line officers. Individual carelessness on the part of men, drinking other water than that sterilized and provided for them, and consuming native-made lemonade, ice cream, etc., has probably caused typhoid fever

in great part. The average, 1.78 per cent, of the total sickness for the period is a decrease, which indicates good sanitation and on the whole is satisfactory.

Malarial fever shows as usual the highest rate, although its average, 15.23 per cent, is a decrease from last report. I do not think that the actual prevalence of malarial fever is indicated by this figure, as many men have occasional slight attacks who do not appear on sick report at all.

The use of the mosquito bar is general and the men understand and appreciate the fact that it prevents the inoculation of malarial poison by mosquitoes.

The very great majority of malarial cases are comparatively mild. Pernicious fever with fatal results does exist in some parts of the island, but such places are nearly uninhabited and avoided by the natives. The nature of this malignant fever is not yet understood by us.

Dysentery does not show much variation, with an average of 13.44 per cent of all sickness. I believe there is a real decrease, notwithstanding the fact that the figures are a little higher than last year. More microscopes are now in use throughout the provinces and many cases are now detected at the outset that might have, under conditions of active field service, been classed as diarrhea. The detection of the amoeba coli is very important, as tropical dysentery is apt to be very deceptive at the beginning.

In diarrheal and gastric diseases there has been a slight increase in proportion, due, I believe, to long service in the Tropics. Most of the slight troubles of the well men who are doing full duty come under this head, and few escape an occasional day or two on sick report with a diarrhea or slight gastric derangement. Many of these cases are probably caused by intestinal parasites, of which there are many varieties in the Philippines. It is difficult to detect some of these without microscopical examinations, and as serious illness is rarely produced by them other than the amoeba dysenteriae it probably happens that they often escape observation.

There was one case of bubonic plague in an enlisted Chinese cook of the Twenty-seventh Infantry, United States Volunteers, at Camp Stotsenberg, near Manila, undoubtedly contracted in the city. Strict quarantine and thorough disinfection prevented any extension of the disease, and the patient recovered.

Smallpox has existed in much less degree than before, but has not yet disappeared totally. Vaccinations have been repeated where unsuccessful as often as ten times during a year's time; the fresh lymph prepared in Manila from caraboa calves acts promptly with a characteristic vesicle and causes little suffering. Some complaint has been made of its nonefficiency at remote stations, and as the difficulty in this climate of transporting lymph promptly and keeping it cool is very great it is probable that time and heat soon cause the virus to deteriorate.

It is an interesting fact that heat stroke generally so much feared in the Tropics is practically unknown here; men often drop out on the march overcome by heat, but fatal stroke and lasting heat exhaustion is very rare.

Wounds and injuries show very little variation, and the proportion of these inflicted by the enemy remains large enough to indicate that, although large movements of troops have ceased the army has, nevertheless, been engaged in about as much marching, skirmishing, and fighting as ever until the last two or three months. From August 1, 1900, to April 30, 1901, in addition to 165 killed in action, 24 died of wounds and 366 received wounds not fatal.

The transports *Meade*, *Indiana*, and *Hancock*, arriving in April, brought many cases of mumps and measles, and each succeeding vessel seems to have these diseases aboard. In this connection it would be interesting to know if the clothing supplied to recruits at Presidio possibly carries this infection from having been made in sweat houses or crowded tenements.

The steady increase in venereal diseases among our troops, from 8.97 per cent in September, 1900, to 20.42 per cent of total sickness in April, furnishes ground for the greatest apprehension, and is an item not exceeded in importance by any other affecting the health and efficiency of the army in the Philippines.

Lest our forces become seriously crippled and an irreparable injury be done the people of these islands by those whose object is to help and elevate them, the subject must be looked at squarely in the face and dealt with as any other contagious disease.

Syphilis is fortunately not the most prevalent of these, and exists in the proportion of about one out of every seven cases of venereal disease. Gonorrhea of a very obstinate nature, and chancroid are about equally prevalent. The latter causes in nearly every case complete noneffectiveness on account of suppurating bubo. A soft sore, very minute, often touched with caustic by the man himself, may heal so promptly that the scar can scarcely be seen; nevertheless a bubo seems inevitable, requiring treatment in hospital and operation.

Venereal disease has of course always existed in Manila and the larger seaports of the Philippines, but much has been imported into Manila by women from Europe, America, and Japan, and by soldiers and sailors.

The native woman outside of the city has hitherto as a rule been free from disease, but it is she who, when infected, will be at once the greatest sufferer and the greatest menace to the public health, because she will have neither means, knowledge, nor opportunity requisite to a cure.

This class of disease is spreading from Manila as a focus into the provinces, and as amicable relations are now nearly universal between Americans and natives it is likely that a large number of women will be infected, and with little prospect of cure.

A segregation of this class of women in Manila to a certain part of the town, a supervision of their health, and a duly recorded treatment of the diseased, should be systematically carried out, and stringent measures are now being taken by the Manila board of health in the matter.

Orders directing bodily inspection of all enlisted men at regular intervals have been issued, with the intention of detecting all diseased soldiers and treating them at a special hospital. Los Banos, on Laguna de Bay, possessing hot springs closely resembling, in the composition of the water, the hot springs of Arkansas, has been selected as a suitable place for the treatment of syphilitics, and a small number are now there undergoing treatment. Maj. J. C. Minor, surgeon, United States Volunteers, who is in charge, and who practiced at Hot Springs, Ark., for years, says: "The water is apparently unlike all other natural hot waters except that of the hot springs of Arkansas, in that to the senses it is essentially a pure, sparkling, palatable, and highly assimilable hot water. Should the analysis show no great quantity of mineral, there is little doubt but that its therapeutic value as an emunctory stimulant will equal or excel that of Hot Springs, Ark."

The main well has an apparent discharge of 3,600 gallons per hour of water of the temperature of 212° F.

Several buildings, some antiquated tubs, 3 large tanks, and 3 vapor closets are on the spot, relics of the Spaniards' hospital. There are no water connections or sewerage, and much repairing, plumbing, etc., will be necessary. The details of the whole plan are being as rapidly as possible carried out.

It is too soon to give, as yet, the results of treatment by the waters.

MORTALITY.

It is gratifying to report a steady decrease in deaths.

This seems to be mainly due to the falling off in the number of those killed in action and died of wounds, but the figures showing deaths from disease give a decrease in some important particulars, and at least a maintenance of former rates in all others except dysentery.

It was expected that the death rate from disease would increase with the length of service of troops on the islands. That this has not done so on the whole for the last nine months is very satisfactory.

The following summary gives total mortality from August 1, 1900, to April 30, 1901, and the percentages of last report are added for comparison:

Cause of death.	Officers.	Enlisted men.	Per cent of total mortality.	Per cent last report.
Killed in action.....	13	252	0.1673	0.2090
Died of wounds.....	1	23	.0243	.0462
Injuries.....	4	50	.0547	.0273
Suicide.....	.....	21	.0212	.0201
Drowned.....	1	58	.0597	.0402
Varicella.....	.....	34	.0346	.0894
Typhoid fever.....	2	65	.0679	.0814
Dysentery.....	2	241	.2462	.1980
Malaria.....	.....	49	.0497	.....
Other diseases.....	8	263	.2745	.2884

An average of 3.6 deaths daily as compared 4.7 of last report.

The mortality rate for the period is about 20.45 per 1,000 per annum; in the last report it was 26.7 per 1,000 per annum.

There are some especially noticeable features in the above table.

The proportion of officers killed in action is very great.

Deaths from wounds received have diminished nearly one-half from last year.

This indicates that in the exigencies of the active work of recent months, the greater facilities in personnel of medical officers and hospital corps have allowed of better and more prompt attention to the wounded.

Dysentery gives a large increase, and this bears out the belief that every case of amebic dysentery should be sent home at once, when the diagnosis is made. It would also appear that length of service does not give any immunity from dysentery, but rather seems to predispose to its acquirement.

Suicides remain at nearly the same ratio.

The mortality for variola has decreased 60 per cent of former rate. In typhoid fever it has diminished 28 per cent.

Malarial fever and results give a very small mortality, notwithstanding their great prevalence. It is commonly observed in the provinces that the natives have "Calentura" as severely as American soldiers, and with a considerable mortality. As out-post duty diminishes and the men can sleep in their cots with mosquito bars every night, malaria will probably diminish very much.

TRANSFER OF INVALIDS TO UNITED STATES.

This constant and unavoidable drain on the strength of our forces remains large, and although the greatest care to choose the subject for transfer has been taken, and each patient is carefully examined by a board of medical officers, the figures show that the loss from transfer for treatment to the United States will be a very large factor in estimating the strength of troops to be kept or afterwards sent for duty in the Philippines.

It has been found poor economy in many cases to keep a soldier here who has apparently recovered from an attack of dysentery and has been returned to duty from hospital, with hardly an exception again to be taken sick. The amount of duty performed by a sick man between his stays in hospital is entirely incommensurate with the ultimate danger to his health or life. It is best to send such a case to the United States as soon as the disease is diagnosed.

Patients with tuberculosis should not stay in the Philippines.

Malarial fever is generally completely recovered from. Nearly all of the well men of a year's service or more have had it, but men saturated with the malarial poison from service in especially unhealthy localities, bloodless and weak, with torpid livers and enlarged spleens, never completely recover here and should be sent home. Such patients furnish fertile soil for dysentery. Experience shows that a lowering of the physical standard for recruits is an expensive luxury, when such men are sent to the Philippines. More especially does this apply to the enlistment of minors. Even a strong, athletic youth, with the measurements of a man of 21, and free from blennish, is seldom a desirable recruit for tropical service. In September I noted that out of 445 convalescents to be sent to the United States for treatment, 129 were under 21, or 29 per cent of the whole number. Such boys are particularly prone to typhoid fever; in fact, 18 or 19 is the favorite age for typhoid fever all the world over. They seem to have malarial fever more severely and become cachectic more rapidly than older men. When the first sense of novelty and adventure wears off the boys lose heart and become homesick; in short, they are more imprudent concerning their own health and less resistant to the disease-producing agents.

An ideal army for the Tropics would consist of men between 25 and 40 years of age.

From August 1 to April 30 the number of invalids sent home for treatment was as follows: Regulars, 1,132; volunteers, 2,861.

These figures are very misleading in the case of volunteers.

The rate sent home for regulars has increased over my former report by just about enough to be accounted for by the lengthened stay of the regular troops in the islands.

In the volunteers, as the time of their muster out drew nearer, it was foreseen that transportation here would be insufficient for all the sick toward the last, and orders were issued to send in to Manila all sick volunteers, even those in regimental hospitals, for transfer to the United States. Many of these cases were trifling and no doubt recovered before a week out of harbor had passed.

The rate of men of the volunteers who should have been sent home under any circumstances, because of imperative need to save life or restore health, would not differ greatly from that for regulars.

The system inaugurated February 25, 1900, of sending men recommended for discharge on surgeon's certificate of disability to Hospital No. 3 for observation has worked satisfactorily. Malingering is detected and the papers are properly completed before the men leave for final discharge at San Francisco. Maj. John S. Kulp, surgeon, United States Volunteers, has supervised this important work.

From May 31, 1900, to April 27, 1901, including 46 men in Hospital No. 3 at the latter date awaiting transfer, there were sent home 526, as follows:

Disability contracted after enlistment in line of duty	380
Disability contracted after enlistment not in line of duty	43
Disability self-inflicted after enlistment in line of duty	10
Disability self-inflicted after enlistment not in line of duty	5
Disability contracted prior to enlistment not in line of duty	88
Total recommended for discharge	526

Cases classified.

Circulatory system	34
Nervous system	60
Digestive system	32
Respiratory system	16
Muscular system	5
Ocular	36
Nasal	1
Aural	35
Venereal	36
Congenital	6
Gunshot wounds	118
Injuries	147
Total	526

This is a large number to lose in less than a year's time, but every care has been taken to select cases for discharge, and it is not likely that the figures will be improved upon as new troops come in.

Of insane soldiers, 121 have been sent home since August 1; of these, 72 were regulars and 49 volunteers. These cases are of melancholia and simple acute mania, and the causes are to be looked for in the general conditions surrounding soldiers' life in the Philippines acting on predisposed men.

It is believed that nearly all are of a temporary nature, and are cured by return to their homes, but I have no reliable statistics on this head, and can not speak with certainty.

Contrary to general belief in the United States, there is not much disability from alcoholism. The habits of the enlisted men differ but little from those in the United States. An exciting cause of a certain proportion of the insanity, as well as the origin of a large part of the drunkenness in the provinces, is the use of the so-called "vino" of the natives, a crudely distilled alcohol, causing very rapid intoxication, which is rather easily recovered from without suffering when a moderate amount is taken. In great excess it causes wild delirium, unconsciousness, and sometimes death, and in habitual users a deterioration of the mental faculties, delusions of persecution, attempted suicide, and aphasia have been observed.

HOSPITALS.

All of the Manila hospitals have been in use during the period covered by this report, and no one could have been dispensed with. In January and February the accumulated sick of the volunteer regiments were collected in Manila and sent home prior to departure of their regiments. I then decreased the bed capacity of the Manila hospitals one-third, and still further decreased the quota of medical officers at the hospitals. As the movement of the sick homeward came abruptly to an end, owing to lack of room on transports, and other sick began to accumulate, I was compelled again to increase the bed capacity of these hospitals. There seems no probability in the near future that any one of these hospitals can be discontinued. They are all modern in equipment, as well as are the departmental hospitals, some of which compare in equipment and size with the hospitals in the city. The regimental hospitals, of varying capacity, have fulfilled their purpose as emergency hospitals, and most cases of ordinary severity are now treated throughout with the regiment. Some of these compare very favorably with the old one and two company post hospitals in the western United States; many are merely extemporized, and as their usefulness depends on their being available for a large part of the regiment, it sometimes happens a newly repaired, neat, and quite complete regimental hospital is rendered

nearly useless by the still further breaking up of troops into small detachments, and a post of three or four companies drops to a garrison of thirty men or so.

It is manifestly impossible to establish anything of the nature of a complete post hospital at every station occupied by troops. The present arrangement is sufficient for present needs.

When the locations for permanent garrisons are finally chosen, on the establishment of peace, the regimental hospital will be a thing of the past.

Under existing regulations the management of the subsistence of hospitals is a constant source of embarrassment and worry. Three distinct messes must be run, exclusive of the private mess of the officers, viz, patients, hospital corps, and nurses. The patients must be still further divided into two classes—those drawing regular rations and those sick enough to use the 40 cents per day allowance. While this, with infinite trouble, can be and is done at the large hospitals, it is utterly impracticable at the small. There is inevitable mixing of the two rations, and endless opportunity for the misuse of the special allowance for the sick. The remedy to my mind is simple—to reduce the allowance to 30 cents per day and allow the sick, nurses, and the Hospital Corps to subsist upon it. I believe this would result in a real saving to the United States. The argument that men of the Hospital Corps would thus receive a better and more costly ration than enlisted men of the line is met by the well-known facts that small squads can not make savings in anything like the proportion that company messes can, and that any saving under this allowance would revert to the commissary department.

The Emergency Hospital, established July 25, 1900, for the purpose of extending emergency treatment to any person in Manila needing it, has been in satisfactory operation, under the charge of Maj. W. F. Lewis, surgeon, United States Volunteers, and is doing much to relieve suffering and expedite the prompt treatment of both injuries and disease.

In addition to emergency work proper the hospital receives all patients among soldiers, citizens, and employees arriving in Manila by inter-island boats, and attends to their transportation to the proper hospitals. A daily sick call is held, and Government employees, including metropolitan police, are treated. A hospital steward and four privates of the Hospital Corps are on duty, with one ambulance, and every telephonic call day or night is answered. From July 25, 1900, to April 24, 1901, 2,385 cases were entered on the record, divided as follows:

Regular troops	384	Volunteer troops	536
Employees:		Civilians:	
American	538	White	209
Filipinos	273	Filipinos	241
Chinese	71	Chinese, etc	33

In response to a cablegram from the Adjutant-General of the Army to the commanding general of the Division of the Philippines, the full equipment of a 100-bed hospital was shipped to Nagasaki on the U. S. Army transport *Sheridan* in January. A sufficient personnel of officers and Hospital Corps accompanied, with Capt. I. W. Rand, assistant surgeon, United States Army, in command. As no instructions were received from Washington regarding the future use of this hospital, it is assumed that its establishment is for the purpose of caring for the sick and wounded on passing transports who are too ill to proceed farther on the journey to or from the United States.

The work of the new army pathological laboratory has proved of incalculable value in clearing up doubtful diagnoses, and in putting the study of the diseases of the Philippines on a scientific basis, and indicating lines of treatment best calculated to cure. It has been in sole charge of First Lieut. R. P. Strong, assistant surgeon, United States Army, who, as president of the board for the investigation of tropical diseases, prepared, at my direction, and issued in February the first number of a series of circulars on tropical diseases.

The primary object of this series of circulars is to furnish physicians arriving in the Philippines with a summary of the diseases to be found here.

The first circular dealt with animal parasites found in the human intestines in the Philippines; the second with dysentery, both amebic and infectious, and the third with bubonic plague, by First Lieut. William J. Calvert, assistant surgeon, United States Army, a member of the Manila board of health.

SANITATION.

Greater interest is taken and more intelligently by both officers and enlisted men in the work of sanitation, notwithstanding that the prevailing diseases keep at about a constant rate without much change from last year.

Less than two years ago the volunteer regiments were raised in the United States, of men ignorant of the first principles of military service; now they are all either already mustered out of service or on their way home for that purpose. After promptly losing their immature, dissipated, and imprudent members in the first few months of their service here, these regiments, prior to leaving the Philippines, were about as healthy and physically efficient a lot of men as could possibly be expected after a year and a half of service in the Tropics. The experienced soldier instinctively observes most of the cardinal rules of personal and local hygiene. It has been ceaselessly reiterated to him that he must carry out certain simple and well-defined hygienic regulations or else sickness and death would follow. The proposition was treated by him at first with all the notorious indifference of healthy men to such advice, but it was not long before its truth was only too well demonstrated by the loss of his comrades, or perhaps his own severe illness, and soon the advantages of living with sanitary surroundings, of drinking pure water, and sleeping under mosquito bars were appreciated by him. When this appreciation once is possessed by the enlisted man he is about as much of a practical sanitarian as we may expect to find him, and even so much he only learns in months or years, a space of time inversely proportional to the severity of his experience.

The use of absolutely pure water is probably of more importance in this country than the observance of all other rules of sanitation combined; and as typhoid fever, dysentery, and the presence of innumerable intestinal parasites originate almost entirely from drinking bad water, it would seem we should in great part eliminate them from our list of diseases.

Circulars and orders have been issued repeatedly, requiring commanding and company officers to use every effort to provide a supply of pure water for their commands, and the monthly sanitary reports show that this is done at all stations in the archipelago. The Waterhouse-Forbes sterilizer is in operation throughout the islands and gives satisfaction, although care in its management must be taken to insure that the water passing through is sterilized. The necessities of field service often require troops to drink bad water, and when men visit Manila they seldom get other than that drawn from the city mains, which is by no means above suspicion. Very few of the hotels, boarding houses, and saloons of Manila provide sterilized water for their guests. Impure water is often used by the natives in the making of ice cream, lemonades, and other soft drinks, which they sell to the troops. A certain percentage of water-borne disease is probably acquired this way; also by the use of badly washed green garden produce. With new troops coming here the utmost vigilance on the part of medical officers is required to keep the sanitary condition even up to its present standard. New men must be broken in and acclimated, and the medical officers must strain every nerve to minimize the inevitable object lessons of death and disease before this is accomplished. Daily sanitary inspections by medical and company officers, of hospitals and barracks; weekly, of the command, by company commanders; and monthly, with reports, by surgeons, should suffice to keep a garrison in good condition.

The inspections by district chief surgeons are of great value, as they have opportunities for comparisons which enable them to give useful advice to officers under them. To superintend the entire system, and to make special inspections himself when the importance of the occasion requires it, the services of an experienced and capable medical officer, with the legal status of an inspector, and not merely detailed for duty, are imperatively needed; he should have the inherent authority of an inspector-general in his own field, and it is earnestly hoped that necessary legislative action on this point will be taken. During the period covered by this report, Maj. L. M. Maus, surgeon, United States Army, performed much valuable work in this direction, including a visit to Benguet Province, in Northern Luzon, to report upon its suitability for a great sanitarium, where soldiers invalid from tropical service in other parts of the islands might be restored to health, and where whole organizations who have served in malarious and unhealthy localities might be stationed for duty. The climate seems to be an ideal one for troops to serve in and keep in good health, but besides the fact that there might be insuperable difficulties in so managing the changing of the troops in the division that all could get sufficient service in this favored district, and at the time they might most need it, it seems to me that invalid soldiers need a more radical change than can be obtained in the archipelago, and that men worn-out by constant and repeated attacks of sickness in the Tropics require a year or two at least in their own country before being again fit for duty here.

The great expense which would be incurred in establishing and maintaining a sanitarium in Benguet, with its inaccessible location, requires caution to be exercised in this matter. The results of troops actually camping in Benguet should first be known, as to their physical condition and the presence or absence of usual tropical diseases.

TRANSPORTATION.

The transportation of over 4,000 invalids, insane, and men to be discharged on surgeon's certificate of disability, to San Francisco has been successfully carried out, and, from what I can unofficially gather, great improvement has taken place in the condition of the large majority. Deaths have occurred from dysentery and other diseases, but on many occasions, after careful deliberation, and on the urgent prayers of the patient, men were sent as a last hope. It is unfortunate that I have not in my possession official statistics concerning the health, recoveries, and mortality of invalids on transports to the United States.

For inter-island transportation of sick to Manila, the hospital ship *Relief* has been the main reliance of the Medical Department. She has been used for the double object of collecting the sick from remote stations for transport to Manila, and more recently for the purpose of giving the benefits of a sea voyage to invalids in Manila who were seemingly not improving in the hospitals. Incidentally, the *Relief* has distributed much-needed supplies to remote stations.

The first consignment of invalids to be given the benefits of a sea voyage on the *Relief* left Manila March 21, and consisted of 140 patients.

Many of these had been on sick report for weeks at the different hospitals. The change of air and food, the interest of the voyage, and the cool nights had a most decided effect for good; 29 were entirely well and 100 much benefited. Major Perley, commanding the *Relief*, was so much struck with the result that he recommended on future voyages of the *Relief* that 150 convalescents should be sent for the benefits of the sea trip.

On April 16, 180 selected patients from Manila hospitals were given this opportunity. The results were equally beneficial, and Major Perley reached the conclusion that cases of dysentery, malarial, and typhoid convalescents do particularly well, but that tuberculosis does not improve and should not be sent.

Short outings in the launch *New York* are given every day for two hours to the sick in Manila hospitals able to stand the little journeys. These are of real benefit to the convalescent sick and give the greatest pleasure, which is evinced by the eagerness of the patients to be allowed to go.

After trying in vain to find in these waters a vessel of light draft, suitable for a hospital ship, and able to enter the shallow harbors and go up the rivers of the archipelago, for the purchase of which authority was received from the War Department, I finally requested that the vessel be bought and fitted out in the United States and sent here.

Three vessels were pronounced by the Medical Department as fitted for this purpose, but all were rejected by the Quartermaster's Department on account of excessive price, or unsuitable machinery requiring expensive alterations. There will always be need of such a vessel, and it is hoped that final action will not be long delayed.

BOARD OF HEALTH OF MANILA.

The board of health of the city of Manila is composed of six active members, all medical officers of the Army, and two honorary members from the medical profession of Manila.

In a report made to the provost-marshal-general, covering the period from July 1, 1900, to April 30, 1901, Maj. Franklin A. Meacham, surgeon, United States Volunteers, president of the board, gives concisely a most interesting history of the operations of his department. The work done was enormous in amount and was performed with a thoroughness and attention to detail deserving the highest praise.

Maj. Guy L. Edie, surgeon, United States Volunteers, was president of the board until December 12, 1900, when he was ordered to the United States and Major Meacham detailed in his place.

The important work of taking a census of the inhabitants of Manila was begun on January 1, and ended in April. It was made under the personal supervision of, and practically by, First Lieut. Harry L. Gilchrist, assistant surgeon, United States Army, chief of the sanitary division, board of health, and is believed to be the first accurate census of the city of Manila.

The total population of the city of Manila, exclusive of officers and men of the Army and Navy, was found to be 244,732, divided as follows:

Americans	8,461
Filipinos	181,361
Chinese	51,567
Spaniards	2,362
Other nationalities	961
Total	244,732

In connection with the census a complete sanitary map of the city was prepared, "on which was checked every house, hut, and outhouse; separate sanitary plans were made also for each premises, with population by age, sex, and nationality."

During the period of ten months covered by Major Meacham's report the total number of births registered in Manila was 3,349, or 18.29 per 1,000. Many births occurred without medical attendance and were not certified to by anyone. This rate is therefore incomplete and unreliable.

The number of deaths, including stillbirths, was 8,671, an annual rate of 42.54 per 1,000, exclusive of Army and Navy. Twelve cemeteries and 1 crematory are in charge of the board of health.

Burial permits are required and certificates of deaths, when not furnished by attending surgeons, are made by municipal physicians after examination of the dead body. A careful check is kept on the permits and cemetery reports. Mistakes are investigated and are very rare.

No disinterment can be made without a permit by the board. An inspector is present at each, and the body must be placed in a hermetically sealed casket.

A system of regular house-to-house inspection is carried on irrespective of special and extra work in epidemics. The city is divided into 10 districts for this purpose, and the available force consists of 1 medical officer (member of board), 1 interpreter, 1 chief inspector, 10 district inspectors, 30 subdistrict inspectors, 60 inspectors.

Ten of these are Chinese and the rest Filipinos. Every house must be inspected at least weekly. Contagious disease is searched for, rat poison is distributed, and disinfection performed when necessary. A sanitary card is posted on each house, on which is noted the condition found by the inspector, with the date of visit. The work of the inspector is thus checked by the chief and district inspectors.

The people evince a most gratifying willingness to accept the sanitary instructions of the board of health, and Major Meacham reports that the sanitary condition of the city is excellent, as far as the inhabitants can make it so, and that the many unhygienic conditions remaining can only be remedied by the municipality and by the expenditure of much money.

Improvements most urgently needed are (1) a system of drainage and sewerage; (2) dredging and cleaning moats and canals; (3) a water supply, pure and ample.

Four hundred and thirteen licenses were acted on, involving physicians, pharmacists and dentists, the sale of food and drink, offensive trades and lodging houses, of which 310 were approved.

The board of health has had to contend with the following infectious or contagious diseases: Bubonic plague, smallpox, tetanus, typhoid fever, tuberculosis, whooping cough, measles, mumps, beri-beri.

Compulsory notification is required of each case of the above diseases except beri-beri and tuberculosis.

Cholera has fortunately not gained an entrance, though present at Singapore and on shipboard at Hongkong.

Bubonic plague is dealt with in the most stringent manner. Two hundred and fifty-four cases with 199 deaths have occurred:

	Cases.	Deaths.
Chinese	166	135
Filipinos	86	62
Spanish	1	1
American	1	0

The following method of dealing with the plague is in use: Medical officers, usually acting assistant surgeons awaiting transportation to the United States and temporarily reporting to the board for duty, are stationed in the infected districts, each having an office with telephonic connection with the board office. Every case of illness and every death in the district is reported to them, and they visit each case and inspect the dead. When necessary, they send the patient or body to the general plague hospital or the Chinese plague hospital, in ambulances used only for this purpose, and summon a disinfecting cart at the same time. An inspector accompanies each patient or corpse to its destination; another takes charge of the house until the disinfecting cart arrives; the floors are wet down with 5 per cent carbolic acid; all clothing and articles which have been in contact with the infected person, and everything not easily disinfected, are burnt in the street; other articles are sent to the steam disinfectant. The house is systematically treated with carbolic solution, which is thrown into all crevices by a force pump; all occupants of the house take a disinfectant bath, and exposed persons are sent to the detention pavilions. The house

owner is compelled to make such alterations and repairs as may be needed, and the house is placarded and visited daily until twelve days have passed. The disinfecting carts are specially constructed and have a metal-lined compartment for articles to be sterilized, besides room for apparatus, etc. Bodies are removed in metallic caskets, to be burned or buried in quicklime. Inspectors are on duty day and night.

Experience shows the infected districts to be about the same as last year. A system of depopulation is being actually carried on. Infected houses and unsanitary hovels in their neighborhood are attacked and cubicles and partitions are removed; outhouses and structures built in yards and unfit for human habitation are destroyed, letting in sun and air; sewers and drains are flushed by the fire department under supervision of the board; all evicted people are given shelter in tents until they can find dwelling places.

These measures will have to be carried on unremittingly, but the very extensive municipal sanitary improvements already mentioned must be accomplished before Manila can be considered a healthy city.

Every precaution is taken to prevent the spread of plague from Manila to the provinces; all passengers leaving by ferries and inter-island boats are inspected in conjunction with the Marine-Hospital Service, and a medical officer inspects all passengers leaving by train.

Smallpox in Manila has been very mild, with 101 cases and only 2 deaths. Shortly after the American occupation the newly appointed board of health began to institute thorough vaccination, principally among the children. This year the majority of cases are adults; vaccination and revaccination are being effectively carried on; 22,590 children and 43,128 adults have received it during the period.

The Vaccine Institute manufactures reliable virus, and 899,900 units were prepared from 57 young caraboa calves in the form of glycerinated lymph. The amount was distributed throughout the archipelago.

The system of house-to-house inspection has revealed a good many cases of leprosy. There are now 159 lepers under treatment in Manila and 27 died during the period. The report of the board to select a suitable island for the segregation of lepers was made and is now in the hands of the civil commission. Until the plan to form such a settlement for the segregation of all lepers in the archipelago is carried out the treatment of the leper will be unsatisfactory and the extermination of the disease impossible.

Measles, mumps, and whooping cough are not common, and are of a mild nature. Mumps has often been confounded at the outset with plague. First Lieut. W. J. Calvert is in charge of the bacteriological laboratory of the municipality. This has only been recently fully equipped, but has done much and varied work on urine, feces, sputum, and blood for the practitioners of Manila. Glanders has been detected in horses and trichina in hogs. Most of the work in the laboratory has been on plague, and 160 blood examinations have been made. The plague organism, its effect on animals, and the pathological changes caused in them have been studied and form the foundation of Lieutenant Calvert's pamphlet on plague, the third of the series of circulars on tropical diseases issued. Cultures of plague from Tokyo and Hongkong have been compared with cultures from Manila.

Work on antiplague, antityphoid, and antitetanus serum has been carried on at the farm in the grounds of the San Lazaro Hospital.

Rinderpest, which is prevalent among the cattle of the Philippines and bears directly, of course, on the public health by affecting the meat and milk supply of the people, is being studied here also. An immunizing serum is being tried, and results are promising. A circular on this disease was issued in English and Spanish, with differential diagnosis from foot-and-mouth disease.

Four hundred and twenty-six blood examinations have been made on native prisoners of war in search of filaria, but only two positive cases were found.

Repeated bacteriological examinations of the water supply of Manila, of the Mariquina River and Laguna de Bay have also been made in the laboratory as a preparation for the contemplated work of providing the city with a pure and ample water supply. A series of water examinations and tests of the purity of the ice manufactured in the city are, independently of the board of health, being made by Maj. Charles B. Ewing, surgeon, United States Army, at the Santa Mesa Hospital.

Chemical analysis of the city water has also been made by the city chemist. The examinations so far are not conclusive, but go to show that the Mariquina River above Montalban possesses marked advantages over the Laguna as a future source of Manila water supply.

The board of health has prepared 16 important municipal ordinances bearing on public health, and submitted them to the board appointed to consider city regulations and ordinances.

The forthcoming annual report of the board will be a full and detailed statement of all its operations for the fiscal year, with tables, maps, and pictures. The operations of the Manila board of health indicate in a perfected form the important public sanitary work which is being done throughout the islands by medical officers of the Army. Every city has its health officer and every little inland town where troops are stationed has its sanitary condition, more or less supervised by the medical officer.

HEALTH OF PRISONERS OF WAR.

A large number of prisoners were held in Manila during the last few months, and it was found necessary to engage native physicians to treat them. The general supervision of their health and the sanitary condition of the prisons is intrusted to the chief surgeon of the separate brigade, provost guard.

Beri-beri prevails quite extensively among the prisoners, and those in the early stages of the disease were, on the recommendation of the chief surgeon, released and discharged, when practicable. The patients were isolated in tents, and every attention paid to hygienic conditions. As the ration for native prisoners was not considered suitable for the disease, it was promptly improved, and in the case of the sick the money value was authorized to be expended for articles deemed necessary for their diet, and a marked improvement was then noted.

Accurate statistics are not at hand for the total period, but between March 10 and April 10, 1901, the total number of prisoners of war was 4,149; total sick, 1,336 (of beri-beri, 697); deaths—beri-beri, 45, other causes, 50. Fifty per cent of all sickness is beri-beri. On April 12 the improved ration was introduced and now there is a great reduction in new cases and many recoveries, 23 having been returned to duty in one day.

MEDICAL PERSONNEL.

At the date of my last report, July 31, 1900, there were 375 posts where garrisons were stationed. To-day there are 479, an increase of 104, counting Manila as a garrison, although troops are located at 23 separate stations in the city.

Although the number of garrisoned posts has increased and the work of the department, outside of the direct care of the health and lives of the officers and men, has become more comprehensive and is still reaching out in many directions, the number of medical officers, allowing for inevitable loss by termination of contract and muster out of volunteers, has not increased proportionately. Even should there be a decided reduction in the total strength of the army in the archipelago, so long as many and scattered towns and barrios are occupied by the army, so long will there be a necessity for a number of medical officers, much larger than is generally deemed sufficient for troops concentrated in regiments or battalions.

On May 15, the total strength of medical officers in the division was 491, non-available 88, leaving 423 available. The following table gives their assignments:

Available officers.

Chief surgeons and assistants (of division, departments and districts)	20
Hospitals	67
Supply	5
With troops	331
Total	423

Nonavailable.

Board of health	7
Board on tropical diseases	2
Attending surgeon	1
Detached service (United States)	8
Sick	11
On transports	2
Foreign service	7
On leave	4
Under orders to return to United States	26
Total	88

It will be seen that, deducting the necessary officers for administrative supply, large hospitals, etc., there are 331 medical officers to care for the troops at 479 separate stations.

The allowance for Manila and base hospitals, board of health, and administration is kept to the lowest limit consistent with the actual efficiency of the office or institution.

I have already expressed the opinion that the proper ratio of medical officers is six-tenths of 1 per cent of the aggregate strength of the Army, to which should be added for service here one-tenth of 1 per cent for emergency. In my last report I stated that a force of 500 medical officers was necessary to properly care for the number of troops then in the Philippines. The present aggregate strength is less than at that time, but much more scattered, and unless a decided reduction in the number of separate stations takes place in the near future, the prospect is that the department will be again seriously crippled for want of medical officers.

In these islands the Medical Department is charged with a duty far beyond the care of the health of the military forces. It is doing now and must continue to do work connected with public sanitation which is never demanded of it in the United States. In Manila the bubonic plague is being fought night and day, lest it become epidemic, and there is always the possibility of cholera entering Manila from some of the infected ports in Asia. A reserve force of medical officers beyond what is actually needed to care for the troops is required.

A reduction of the military strength without a concentration of troops will not materially relieve the situation. It is the distance between posts and not the numerical strength that should be counted. A soldier at a station of 30 men is just as liable to need medical or surgical aid as at a regimental post, and is just as much entitled to it. If he can not promptly obtain treatment from a neighboring station, a medical officer should be stationed with the detachment at the 30-man post.

Assuming a continuance of the present conditions, I still deem 500 medical officers necessary.

There is no fear that a large excess of officers will, under any conditions, be present in the Philippines, as chief surgeons of departments have orders to report all surplus surgeons for annulment of contracts.

Just now the plague in Manila is at its seasonal height, and with a view of utilizing the services of contract surgeons in Manila awaiting transportation home, I have directed them to report to the president of the board of health for duty as sanitary inspectors.

The army medical examining board has been in session in Manila since April 28, 1900, and has examined 150 candidates for the Medical Corps, United States Army. Of these, 44 have passed successfully and 25 are already commissioned and 19 approved candidates remain. The candidates were entirely from medical officers of volunteers and acting assistant surgeons, United States Army.

The medical officers in this division have, as a rule, been zealous and efficient in performing their duties, responding promptly when called upon for extra services, which they rendered cheerfully and without complaint.

The sanitary work, both in its military and civilian aspect, has been exceptionally good, and the vigilance of medical officers in this respect has been an important factor in securing the comparative freedom of the army from the ravages of tropical and infectious diseases.

The following medical officers were killed in action or died from disease while in the performance of their duty:

Killed in action.—Acting Asst. Surg. F. W. Hulseberg, United States Army, killed August 1, 1900, in engagement at Majayjay, Laguna, Luzon, P. I.; Acting Asst. Surg. C. B. Ross, United States Army, killed February 2, 1901, between Tayum and Bucay, Abra, Luzon, P. I.

Died from disease.—Maj. W. R. Hall, surgeon, United States Army; Maj. J. C. Davis, surgeon, United States Volunteers; First Lieut. L. P. Smith, assistant surgeon, United States Army; First Lieut. S. M. Stuart, assistant surgeon, United States Volunteers; Acting Asst. Surg. J. A. Rabbett, United States Army; Acting Asst. Surg. S. A. Yule, United States Army.

MEDICAL SUPPLIES.

Medical supplies are now sufficient for the needs of the division, and there is little complaint as to quality.

Every care is taken to check expenditure, and district surgeons are instructed to keep a vigilant eye on the use of medicines at their posts when inspecting.

The standard supply table in use in the United States authorizes an allowance of many

medicines entirely inadequate to the actual need of troops in the Tropics. Broadly speaking, in remedies used for malarial and intestinal complaints, tonics, restoratives, dressings, and topical applications for skin diseases, ulcers, boils, and slight injuries, the expenditure is relatively very large. Men doing duty are at all times more or less under treatment, if for nothing else than a patch of dhobie itch, or an inflamed abrasion from a new shoe. Whole companies in specially malarious localities are taking quinine prophylactically. Strychnia and iron are used daily by scores of men not on sick report. The dividing of the troops into many small detachments and the necessary supply of simple remedies to small scouting parties cause an unavoidable wastage. Of late there has not been much loss in transit of medical supplies.

A supply table for use in the Philippines, calculated on a six months' basis, and making due allowance for local needs, is in the hands of chief surgeons and seems to be a satisfactory guide for medical officers passing upon requisitions.

It was found necessary, in the interest of economy, to establish supply depots in each department, besides the general depot for the division. Subdepots, under charge of chief surgeons of districts, are also in operation at Vigan, Aparri, Calamba, Nueva Caceres, Cebu, and Cagayan. This plan works satisfactorily and prevents delay and loss, which would inevitably occur with only one central supply depot.

Ice machines are in operation at 17 points, and prove of inestimable value in the treatment of the sick and the comfort and health of the troops. There has been much complaint on account of alleged inferior workmanship in some of these machines, causing constant breakdowns and great trouble and expense in repairs. The output of ice seems also not always to be what is claimed for the machine. Extra strong apparatus is required for use here, as energy is expended in lowering the tepid water supplied to the freezing point.

HOSPITAL CORPS.

The following is the numerical status of the hospital corps of the division:

On duty August 1, 1900	2, 356
Gained:	
From United States	798
Transferred from line	4
From desertion	1
Enlisted and reenlisted	23
Appointed hospital stewards from United States Volunteers	8
Total gains	834
Loss:	
Transferred to United States	443
Discharged	108
Died	24
Deserted	9
Transferred to line	1
Total loss	585
On duty April 30, 1901	2, 605

Under present circumstances I deem a 5 per cent allowance of Hospital Corps to the aggregate strength of the command to be necessary in the proportion of one hospital steward, or acting hospital steward, to each five privates of the corps.

A diminution of the force in the Philippines, and especially a concentration at central points, will allow a great reduction in this estimate.

Noncommissioned officers and privates have performed duties calling for good judgment, knowledge, and self-reliance, often in the absence of medical officers. Some of them have profited by their experience in tropical diseases to such an extent that confidence can be placed in their ability to recognize the severity of symptoms in a given case, and to give due notice to neighboring surgeons. When several separate posts are under the care of one surgeon this is a valuable acquirement.

It is gratifying to note that officers and enlisted men of the line as a rule appreciate and commend the work of the hospital corps man. Dangers and hardships have been shared by each equally. The members of the Hospital Corps have done their duty faithfully and fearlessly.

The school of instruction for the hospital corps at hospital No. 3 has graduated three classes in sessions of 14 weeks each; total number of scholars 137, of whom 50 received diplomas. The fourth class, now undergoing instruction, consists of 60

men. The interest taken and results accomplished more than justify the establishment of the school.

Instruction of a practical kind has been given detachments of the Hospital Corps at all stations. There are so many small posts with only one or two privates of the corps that litter drill has, as a rule, been impracticable. With very few exceptions the men have seen field service and understand the use of dressings and the handling of wounded. Too much of this kind of instruction can not be given. In my opinion drill with the ambulance and litter, according to any kind of prescribed manual, is time largely wasted. Instruction at centrally located schools, followed by service with troops in the field and garrison, and the grading of privates in two or three classes, according to efficiency and nature of duties, should give us a personnel of the highest attainable efficiency. I have already expressed my views at length on this subject in two letters to the Surgeon-General.

The following members of the Hospital Corps have performed such special services as entitle them to particular mention: Hosp. Steward E. C. Baldwin, for distinguished service in action; Private William H. Phelps, Hospital Corps, for distinguished service in action at Manicene, P. I.; Private Michael Ilitz, Hospital Corps, for distinguished service in action at Marandaque, P. I.

The army nurse corps, finally put on a permanent basis by recent legislation, had 107 members on duty April 30, 1901, at the larger hospitals, and performed efficient and faithful service. In addition to these, seven male contract nurses are still in service.

REPORT OF MAJ. V. HAVARD, SURGEON, UNITED STATES ARMY, CHIEF SURGEON, DEPARTMENT OF CUBA, JULY 22, 1901.

I have the honor to submit the following report of the operations of this office for the fiscal year ending June 30, 1901:

The health of the troops in Cuba during the year has been very good, showing a marked and steady improvement upon former years. Thus, while during the year ending June 30, 1900, the admissions to the sick report were 322 per cent, with 1.51 per cent of deaths, the admissions during the past year are only 193 per cent, with 1.25 per cent of deaths. Comparing the results obtained in the appended table for the island of Cuba with the statistics in the last report of the Surgeon-General (calendar year 1899), we find that our ratio of admissions is less than that for all troops outside the United States (252), but more than that for troops stationed in the United States (168). In like manner, our ratio of deaths is less than that for all islands (2.55), but more than that for the United States (0.79). Our mortality was largely increased by outbreaks of yellow fever, a disease not likely again to occur among troops in Cuba, except possibly in a scattering, sporadic manner. If we deduct the number of yellow-fever cases from the total mortality we obtain a percentage of 0.80, practically that of the United States.

Further comparison furnishes instructive details. In Cuba the ratio of admissions for diarrheal diseases, dysentery, malarial fevers, and yellow fever, as should be expected, is higher than in the United States, but that of the common infectious diseases, such as scarlet fever, measles, smallpox, influenza, mumps, diphtheria, is very much lower, the majority of cases under the heading of "Other infectious diseases" in our tables being vaccinia; that is, the condition produced by vaccination. There was not a single case of smallpox during the year. The ratio of typhoid fever is about one-third that of the United States, and much greater in western Cuba, where are the large seaport towns, than in the eastern part of the island. Strangely enough, tuberculosis among our troops is more common in Cuba than in the United States, as 0.44 to 0.32, and about the same as in all the islands (0.45), which is remarkable, in view of the fact that other diseases of the respiratory system, such as bronchitis and pneumonia, are almost unknown. This relative frequency of tuberculosis among soldiers in Cuba, and its great prevalence among civilians, would tend to show that a rather high and equable temperature all the year round is not by itself a factor of great importance in the prevention and cure of that disease.

Our record for syphilis and other venereal diseases is bad, being nearly double that of the United States, and apparently also worse than that of all the islands. This evil has always been one of the troublesome problems to confront surgeons in Cuba, and there is no satisfactory solution in sight. About one-eighth on the sick report are victims of it. Were it possible to examine all prostitutes and subject them to treatment when necessary, these diseases would be much less prevalent; but in several garrison towns there is no law requiring examination, or else it is so loosely applied by the municipal authorities that it fails of its purpose. Even when applied with ordinary diligence it does not reach clandestine prostitution nor the many women living in a state of concubinage. It has been proposed to apply the remedy inside

instead of outside, and subject all enlisted men to a weekly examination, those found diseased being placed under treatment and debarred from post exchange and pass privileges. There is no question as to the excellent results of this plan wherever put into practice, but the objections against it are so strong that it is never extended beyond a few posts, and the wisdom and practicability of enforcing it as a general rule is very doubtful. The ratio of alcoholism is likewise high, at least double that of the United States. This is, in a large measure, attributable to the cheap and wretched alcoholic beverages sold in all parts of the island, especially since the prohibition to sell intoxicating drink in the post exchanges.

It is also interesting to compare the western half of the island, comprising four provinces, with the eastern half, comprising the provinces of Santiago and Puerto Principe. In the western half the mean strength of the command is 3,344, and the percentage of admissions only 150, which is less than in the United States. In the eastern half, on the contrary, with mean strength 1,772, the percentage of admissions is 274, not only more than the United States, but greater than for all the islands. The difference depends mostly upon the much greater number of cases of diarrheal diseases and malarial fever, so that, after making due allowance for the personal equation of medical officers and the smaller size of posts, it is safe to conclude, leaving yellow fever out of consideration, that the eastern half of the island does not enjoy as good hygienic and climatic conditions as the western half; thus, five deaths from malarial fever occurred in the province of Santiago and none in any of the other provinces. In my report for the fiscal year ending June 30, 1900, it was also shown that malarial fever gradually increased in frequency and severity from the western to the eastern end of the island.

The ratio of deaths per 1,000 is 13.6 for western and 10.1 for eastern Cuba, a difference due to the 24 cases of yellow fever occurring in the western provinces. If we deduct these, the ratio of deaths will be less for the western than for the eastern provinces.

With the acquisition of our recent knowledge of the propagation of malarial fever it may be taken for granted that this preventable disease will be hereafter greatly reduced and at most posts practically eliminated. As an instance, for the week ending June 23, 1900, there were 34 cases of malarial fever under treatment at Rowell Barracks (Cienfuegos). A year afterwards, for the week ending June 22, 1901, chiefly in consequence of sanitary measures promoted by the post surgeon, Lieut. A. E. Truby, there was not a single case.

Yellow fever.—In my report for the fiscal year ending June, 1900, I described three outbreaks of yellow fever outside of Havana involving American troops—at Santiago de Cuba, Santa Clara, and Quemados. That of Santiago ended in October, 1899, and, thanks to the energetic measures carried out by the chief surgeon, Maj. L. C. Carr, not a single case has occurred since then in that city (troops and civilian population), although previously strongly contaminated. The other two outbreaks came to an end in July, 1900. In June, July, and August, 1900, 30 cases occurred at Pinar del Rio Barracks, with 9 deaths. The first few cases were unrecognized by the surgeon and the infection was allowed to spread before proper measures of isolation were taken. Five sporadic cases occurred at Hamilton Barracks between August and November, but none was permitted to become a focus of infection. The last cases recorded among enlisted men are the nine who were experimentally inoculated by infected mosquitoes at Quemados in December, January, and February, without a single death. Since then all our posts have been absolutely free from yellow fever.

In the summer of 1900, on the recommendation of the Surgeon-General, a board of medical officers consisting of Maj. Walter Reed, United States Army, and Contract Surgeons Carroll, Agramonte, and Lazear, United States Army, was convened in Havana for the investigation of tropical diseases. The result of its experiments, as already well known, was one of the most brilliant medical discoveries of the age, namely, the mode of transmission of yellow fever, and, as a natural consequence, a complete revolution in the methods adapted to prevent and combat this disease. The doctrine of the transmission of yellow fever by the bite of mosquitoes having been proved by incontrovertible experiments on nonimmunes and fomites proved to be harmless, the following circular, having received the sanction of the Surgeon-General, was published:

CIRCULAR, }
No. 5. }

HEADQUARTERS DEPARTMENT OF CUBA,
Habana, April 27, 1901.

Upon the recommendation of the chief surgeon of the department, the following instructions are published and will be strictly enforced at all military posts in this department:

The recent experiments made in Habana by the Medical Department of the Army

having proved that yellow fever, like malarial fever, is conveyed chiefly, and probably exclusively, by the bite of infected mosquitoes, important changes in the measures used for the prevention and treatment of this disease have become necessary.

1. In order to prevent the breeding of mosquitoes and protect officers and men against their bites, the provisions of General Orders, No. 6, Department of Cuba, December 21, 1900, shall be carefully carried out, especially during the summer and fall.

2. So far as yellow fever is concerned, infection of a room or building simply means that it contains infected mosquitoes; that is, mosquitoes which have fed on yellow fever patients. Disinfection, therefore, means the employment of measures aimed at the destruction of these mosquitoes. The most effective of these measures is fumigation, either with sulphur, formaldehyde, or insect powder. The fumes of sulphur are the quickest and most effective insecticide, but are otherwise objectionable. Formaldehyde gas is quite effective if the infected rooms are kept closed and sealed for two or three hours. The smoke of insect powder has also been proved very useful; it readily stupefies mosquitoes, which drop to the floor and can then be easily destroyed.

The washing of walls, floors, ceilings, and furniture with disinfectants is unnecessary.

3. As it has been demonstrated that yellow fever can not be conveyed by fomites, such as bedding, clothing, effects, and baggage, they need not be subjected to any special disinfection. Care should be taken, however, not to remove them from the infected rooms until after formaldehyde fumigation, so that they may not harbor infected mosquitoes.

Medical officers taking care of yellow fever patients need not be isolated; they can attend to other patients and associate with non-immunes with perfect safety to the garrison. Nurses and attendants taking care of yellow fever patients shall remain isolated, so as to avoid any possible danger of their conveying mosquitoes from patient to non-immunes.

4. The infection of mosquitoes is most likely to occur during the first two or three days of the disease. Ambulant cases—that is, patients not ill enough to take to their beds and remaining unsuspected and unprotected—are probably those most responsible for the spread of the disease. It is therefore essential that all fever cases should be at once isolated and so protected that no mosquitoes can possibly get access to them until the nature of the fever is positively determined.

Each post shall have a "reception ward" for the admission of all fever cases, and an "isolation ward" for the treatment of cases which prove to be yellow fever. Each ward shall be made mosquito-proof by wire netting over doors and windows, a ceiling of wire netting at a height of 7 feet above the floor, and mosquito bars over the beds. There should be no place in it where mosquitoes can seek refuge, not readily accessible to the nurse. Both wards can be in the same building, provided they are separated by a mosquito-tight partition.

5. All persons coming from an infected locality to a post shall be kept under careful observation until the completion of five days from the time of possible infection, either in a special detention camp or in their own quarters; in either case their temperature should be taken twice a day during this period of observation so that those who develop yellow fever may be placed under treatment at the very inception of the disease.

6. Malarial fever, like yellow fever, is communicated by mosquito bites and therefore is just as much of an infectious disease and requires the same measures of protection against mosquitoes. On the assumption that mosquitoes remain in the vicinity of their breeding places, or never travel far, the prevalence of malarial fever at a post would indicate want of proper care and diligence on the part of the surgeon and commanding officer in complying with General Orders, No. 6, Department of Cuba, 1900.

7. Surgeons are again reminded of the absolute necessity in all fever cases to keep from the very beginning a complete chart of pulse and temperature, since such a chart is their best guide to a correct diagnosis and the proper treatment.

By command of Major-General Wood:

H. L. SCOTT, *Adjutant-General.*

Hygiene of posts.—All enlisted men are in comfortable, permanent barracks, with one exception. The cavalry troop at Camp McKenzie, Puerto Principe, are still under canvas, but with the benefit of every improvement that a camp admits of. Five of our largest posts have been built on new selected sites since the American intervention, and combine as many favorable hygienic conditions as possible; the others occupy old Spanish quarters more or less extended and renovated and answering their purpose very well. The disposal of garbage and refuse is simple and effect-

ive; most of our posts, being near the shore, dump everything into the sea; none has a crematory. All the posts built on new sites (Columbia Barracks, Hamilton Barracks, Rowell Barracks, Cabana Barracks, Morro Castle (Santiago) Barracks) are provided with modern sewerage with outlet into the sea. At other posts the milk of lime and excavator system is successfully employed, while a few still use the old-fashioned latrines.

The clothing is, in the main, well adapted to the climate, with the exception of the campaign hat; this should have an all-round space outside the sweat band for ventilation and, if possible, be made of rain-proof material. Since the helmet is impossible in the field, it seems necessary to perfect the campaign hat until entirely satisfactory. The criticism commonly heard against the field uniform, and in which I concur, is its homely simplicity, its lack of military neatness and smartness; for instance, the combination of khaki trousers and blue shirt is not effective from a military point of view, and the efficiency of many men is impaired by their inability to use suspenders. I believe the soldier should always wear an outside garment, let it be ever so thin, whether or not he wears an undershirt; this arrangement has also sanitary advantages well pointed out by Capt. M. F. Steele.

The food is generally satisfactory, and it would be difficult to provide for it better than by existing regulations. Very few complaints have appeared in sanitary reports. It is true, nevertheless, that in Cuba good palatable fruits are neither common nor cheap; that specially those to which North Americans are accustomed and most fond of are very rare and sadly missed, and that vegetables are seldom plentiful. These deficiencies, however, concern the luxuries rather than the necessities of the soldier's life. The vexed question of the quantity of meat which should be consumed by the soldier in this climate to maintain his most effective health seems to have been practically solved by common experience. It may be doubtful whether North Americans eat as much in Cuba as in the United States, but the proportion of meat to the whole quantity of food consumed is fully as great here as in the colder regions. At Columbia Barracks, our largest and most important post, with a garrison 1,300 strong, fish (canned salmon) is only drawn once a month in lieu of meat; at the other posts in the immediate vicinity of Habana no fish is drawn at all. It is further found that at Columbia Barracks at least 93 per cent (89 as beef, 2½ as pork, and 1½ as chicken) of the meat allowance is consumed, the remaining 7 per cent being traded off for eggs, butterine, and post-exchange articles. With this diet, the number of admissions for diarrhea at that post during the past year was 9.42 per cent, as against 9.45 per cent for troops stationed in the United States.

Particular care has been given to the building, repair, and equipment of post hospitals so as to give sick soldiers all the advantages of modern treatment with the best hygienic surroundings. These hospitals are more or less on the pavilion system, consisting of frame buildings with very free ventilation, double roofs, and wide porches, the wards rather large so as to secure unrestricted air movement. None of the old Spanish stone hospitals are now in use for soldiers, except at Holguin. It has been demonstrated that all classes of surgical operations can be performed in Cuba with at least the same chance of success as in the United States. There is no longer any general hospital in the department, this having been found unnecessary after conditions had settled to those of normal and peaceful times. Every post takes care of its own sick and wounded, with the exception that in cases of major operations surgeons who do not possess the necessary qualifications send their patients to Columbia Barracks or to Morro Castle (Santiago) for treatment at the hands of skilled operators. At Columbia Barracks, Maj. A. N. Stark, and at Morro Castle, Maj. L. C. Carr and Lieut. I. A. Shimer, have done very successful surgical work, for which they are entitled to much credit.

Movements of the troops and medical officers.—On July 1, 1900, the then Division of Cuba consisted of three departments: Department of Habana and Pinar del Rio, Maj. J. R. Kean, surgeon, United States Army, chief surgeon; Department of Matanzas and Santa Clara, Maj. F. J. Ives, surgeon, United States Army, chief surgeon; Department of Santiago and Puerto Principe, Maj. L. C. Carr, surgeon, United States Volunteers, chief surgeon. By General Orders, No. 98, A. G. O., July 23, 1900, these three departments were reduced to two, namely, Department of Western Cuba (including the four western provinces), under Gen. Fitzhugh Lee, Maj. J. R. Kean, chief surgeon, and Department of Eastern Cuba (including the two eastern provinces), under Gen. Samuel M. Whitside, United States Volunteers; Maj. L. C. Carr, chief surgeon, succeeded during leave of absence by First Lieut. Ira A. Shimer, assistant surgeon, United States Army.

On November 15, 1900, the Departments of Eastern and Western Cuba were discontinued, and the division reduced to the Department of Cuba. However, on account of the remoteness of certain posts in the eastern part of the island the prov-

ince of Santiago was organized into a district under Gen. Samuel M. Whitside, United States Volunteers, with complete district staff; First Lieutenant Shimer, chief surgeon, succeeded on his return from leave by Maj. L. C. Carr. This consolidation and the departure of the two regiments of infantry was followed by the abandonment of 11 garrisoned posts, the surplus medical officers and hospital corpsmen accompanying the troops to the United States or being otherwise disposed of.

There are now in the department 14 garrisoned posts, each with one or more medical officers, and one subpost (Baracoa) in charge of an acting hospital steward (graduate of medical college). There are, besides, one supply depot at Habana and one infectious-disease hospital at Santiago de Cuba, the latter to be turned over to the municipal authorities as soon as possible.

The medical officers on duty in the department on June 30, are as follows:

United States Army:	
Surgeons, with rank of major	4
Assistant surgeons, with rank of captain	1
Assistant surgeons, with rank of lieutenant	5
United States Volunteer Army:	
Surgeons, with rank of major	2
Assistant surgeons, with rank of captain	8
Contract surgeons	13
Dental surgeons	1
Total	34

Of the above medical officers, Maj. W. C. Gorgas is on special duty as chief sanitary officer of Habana, Maj. J. R. Kean as superintendent of the department of charities, and Lieut. I. A. Shimer as sanitary inspector of the city of Santiago. With these exceptions all are on military duty.

In addition to their proper military duties, most medical officers are also necessarily more or less concerned in the sanitation of towns, especially garrison towns. Thus, to prevent the infection of troops, on April 17, 1901, the following circular was published:

HEADQUARTERS DEPARTMENT OF CUBA,
Habana, Cuba, April 17, 1901.

SIR: The department commander directs that the surgeon stationed at your post shall act as medical inspector of the town of ——. He shall advise the commanding officer on all matters in said town which are liable to involve the health of the troops. His chief duties as medical inspector shall be:

1. To keep himself informed of the sanitary condition of the town and to make such special investigations and recommendations as he may deem necessary.

2. To inspect all hospitals in which fever cases are admitted, in order to ascertain the nature and number of these cases, and whether the provisions of circular letter of March 5, issued by the superintendent of charities, by order of the military governor, are being complied with.

3. To investigate the prevalence of mosquitoes, their species, and the extent to which they produce malarial and yellow fever infection, the measures adopted to prevent their propagation, and the success thereof.

4. To ascertain what regulations (if any) are enforced regarding the examination of prostitutes, and their isolation and treatment when diseased.

On the last day of each month (or oftener if necessary), he will report to the chief surgeon of the department, through the post commander, the cases of infectious diseases which occurred during the month in the town, the general result of his inspections and investigations, and all other sanitary matters whereby the health of the troops may be affected.

A copy of this communication has been furnished the mayor of — with a letter which it is hoped will secure his full cooperation in the matter.

Very respectfully,

H. L. Scott,
Adjutant-General.

The COMMANDING OFFICER.

Hospital corps.—The hospital corps consists of:

Hospital stewards	11
Acting hospital stewards	17
Privates	144

The number of non-commissioned officers is somewhat short of requirements, while that of the privates is slightly in excess of the official allowance; a few of the

latter are now being examined for detail as acting stewards. So far as practicable, a hospital school has been organized and maintained at Columbia Barracks, where all corps men ignorant of their duties are sent for training and instruction.

There are also, at present, 8 female nurses on duty in the department, namely, 4 at Columbia Barracks, 2 at Cabana Barracks, and 2 at Hamilton Barracks. These nurses are all women of character, who perform their duties diligently and efficiently. Despite the wisest regulations, female nurses will be now and then, perhaps without any fault of theirs, a troublesome and demoralizing factor at posts, and I believe it will be in the interest of the service to employ them only at large, important hospitals, and never less than two, or still better, three or four together.

Habana.—The work of sanitation in the city of Habana has been prosecuted with undiminished vigor under the able direction of Maj. W. C. Gorgas, United States Army, and with the same gratifying results, as shown by the appended table. The death rate (24.26) has changed but little during the past six months, indicating slight but continuous improvement. Those diseases propagated by mosquitoes, namely, malarial fever and yellow fever, have been very much reduced, while those resulting from defective drainage, absence of sewers, and bad general sanitation, show no reduction, the number of cases of enteritis, on the contrary, having much increased. It is to be lamented that the great work of sewerage and paving, without which the complete sanitary regeneration of Habana is impossible, has not yet been begun; but there is good reason to believe that this much-needed and inevitable improvement will not be postponed much longer. The diseases which, in Habana would be more especially benefited by sewerage are tuberculosis, enteritis and typhoid fever. The mortality of tuberculosis fell from 1,307 in 1899, to 851 in 1900; during the same period, that of enteritis fell from 1,163 to 560, and that of typhoid fever from 240 to 90; but from present indications it would seem that, under existing conditions, the climax of practicable improvement has about been reached, and that the above figures will not be much further reduced until the city is well sewered and the vicious crowding in tenement houses has been remedied. The discovery that mosquitoes breed abundantly in cesspools has also convinced us that there can be little hope of stamping out yellow fever and malarial fever until these cesspools have been replaced by modern sewerage.

The well planned and relentless war carried on against mosquitoes has been productive of remarkable results. Thus, during the first six months of 1900, the mortality from malarial fever was 247; during the last six months, 97, and during the first six months of 1901, only 75. The record of yellow fever is equally interesting. During the first six months of 1900 there were 24 deaths; on account of the unprecedentedly large immigration and consequent increase of nonimmunes the mortality rose to 286 during the last six months, a mortality, however, whose ratio to the number of non-immunes is much lower than ever before in the history of Cuba. It was only during the last winter that the machinery of the sanitary department became fully adjusted to its new purpose—the destruction of mosquitoes and protection of patients from their bites; the sequence, if we may not surely say the consequence, is as follows: January, 9 deaths; February, 6 deaths; March, 2 deaths; April, May, and June, none. It is not reasonable to suppose that all infected mosquitoes have been destroyed, and that no more yellow fever is to be expected in Habana; this deduction is especially unwarrantable in view of the fact already noted, that so many of these insects breed in cesspools out of reach; but it seems logical to infer that a large proportion of infected mosquitoes have been killed or rendered harmless, that hereafter cases of yellow fever will be much fewer than last year, in spite of the fact that non-immune immigrants are greatly increasing every month, and that, after the construction of sewers, the complete stamping out of the infection will be quickly and easily accomplished.

Obligatory vaccination.—Smallpox being a constant and increasing danger in Cuba, a commission was appointed, of which the chief surgeon was president, to study the subject and propose a remedy. Upon its recommendation, Civil Orders No. 165, of June 24, 1901, was issued, making vaccination and revaccination obligatory in Cuba, and establishing a central vaccine institute in Habana, with complete modern equipment for the production of the virus needed for the whole island.

Immigration station.—After the close of the Spanish-American war, immigration, which had stopped since 1895, was actively resumed and on a larger scale than ever. During the year of 1899, 16,260 immigrants arrived in Habana; in 1900, 24,124, and during the first six months of 1901, 7,450. As these immigrants furnish the great majority of non-immunes from which yellow fever is fed, it was deemed necessary to take especial precautions to prevent their infection. All non-immune immigrants on their arrival are taken to a detention station, on the healthiest site around the bay, where they await in comfort and safety offers of employment. Earnest efforts are

made to send as many as possible to the rural districts. "In this way all are benefited; the immigrant who procures work without hardship or danger, the city of Habana, which is ridden of dangerous non-immune agglomerations, and employers, who are enabled to get all the hands they require with the least trouble and expense."

REPORT OF MAJ. WILLIAM B. BANISTER, SURGEON, UNITED STATES VOLUNTEERS,
CHIEF SURGEON, CHINA RELIEF EXPEDITION.

PEKIN, CHINA, *October 15, 1900.*

I have the honor to make the following report of the expedition to China in the capacity of surgeon, Ninth United States Infantry, and as chief surgeon China relief expedition, as far as concerns the operations of the Medical Department. This report covers the period from June 22, 1900, the date I reported for duty with the Ninth Infantry, to September 25, 1900, when I was relieved from duty as chief surgeon of the expedition by Maj. Francis J. Ives, surgeon, United States Volunteers, per paragraph 1, General Orders No. 19, headquarters China relief expedition, dated Pekin, China, September 25, 1900. By virtue of paragraph 11, Special Orders No. 70, headquarters Department of Southern Luzon, dated Manila, P. I., June 20, 1900, I was relieved from duty as chief surgeon first district, Department of Southern Luzon, and ordered to accompany the Ninth Infantry to China. I was relieved by Maj. W. P. Kendall, brigade surgeon, United States Volunteers, on June 21, and on June 22 reported for duty with the regiment. Only a part of the regiment had arrived in Manila, and was quartered part in the Malate Barracks and part in the Exposition Barracks. First Lieut. Charles E. Marrow, assistant surgeon, United States Army, Contract Surgs. William W. Calhoun and Fred M. Barney were ordered for duty on the expedition. Contract Surg. William W. Calhoun reported on June 25, and the others not until the morning of the 26th, the day of embarkation. This left the entire work of equipping and organizing the medical department to me without assistance, and also the care of the sick of the regiment, which had in great part arrived. One hospital steward, 3 acting hospital stewards, and 16 privates were detailed to accompany the expedition. The hospital steward and 12 privates reported on the afternoon of June 25. Arrangements were made for the companies quartered at the Exposition Barracks to receive medical attention from hospital No. 2, which was close by, and a contract surgeon was detailed from headquarters, Division of Philippines, to hold sick call at Malate Barracks. The requisitions for medical supplies were filled and packed in the medical supply depot in Manila and turned over to the Quartermaster's Department for transportation to the *Logan*. The regiment embarked on June 26, but Capts. Thomas S. McCaleb and George Palmer were sent to hospitals in Manila, as they were incapacitated for field service, also several enlisted men. In a letter from headquarters Ninth Infantry I was directed on June 24 to send the necessary medical supplies, 1 surgeon, 1 steward, and a suitable number of hospital-corps men on the transport *Port Albert*, which transported the stock, which was under charge of 100 men. Acting Assistant Surgeon Barney, 1 acting hospital steward, and 4 privates were detailed for this duty. It soon developed that a great many men in the regiment were suffering from malarial cachexia and dysentery and had avoided going on sick report before leaving, from the fear that they would be left behind. Sixty-one of these men were left on the *Logan* for hospital treatment.

The regiment arrived off Taku, China, on July 6. The First and Second battalions left the *Logan* on separate lighters on July 9, Assistant Surgeon Marrow with 1 acting hospital steward and 4 privates with the First Battalion and I with 1 acting hospital steward and 4 privates with the Second Battalion. Contract Surgeon Calhoun remained on board the *Logan* with the Third Battalion, and an acting hospital steward and 4 privates were left with him. This battalion did not arrive in time to participate in the battle of Tientsin. The First Battalion arrived at the foreign concession of Tientsin on July 10 and the Second Battalion on July 11 about 10 p. m. During the 12th I was occupied in separating the medical supplies from the vast amount of material contained in the lighters and arranging an operating room in the marine hospital, which was under the charge of Passed Assistant Surgeon Oliver D. Norton, who arranged with me for the joint use of this building for the wounded of both the marines and soldiers, and, in fact, it was the only building at the time available. I was in general charge, being the ranking officer, as chief surgeon of the United States forces in China, and during the entire period of our association the army and navy medical departments worked together in perfect accord and with mutual assistance. Our troops were formed for attack at 3 a. m. July 13, and at 3.30 a. m. moved out on the road to the Walled City in conjunction with English and Japanese troops. As our columns came under the fire of the enemy—

rather a long-range fire—we were deployed and advanced on the mud wall in open order. Columns of troops could be seen skirting this wall and, protected by it, advancing toward the main gate. As we advanced 1 man was killed and 7 wounded in the First Battalion. This delayed Assistant Surgeon Marrow, on duty with that battalion, so that after we charged across the bridge in front of the main gate and then to the left over the mud wall I was the only medical officer on duty with the two battalions, though I was not aware of the fact until later in the day. After going over the mud wall we could see another wall, apparently of brick, about 1 mile or a mile and a half off, and this was the wall proper for the Chinese City of Tientsin. Our attack began about 5 a. m. After advancing on to the plain between the two walls the fire of all arms from the enemy was most severe and many of our men were hit. Thirty-two men had been detailed as litter bearers from the regiment, but as soon as the fire became hot they threw the litters down to fight to better advantage. This will always be the case with such details, and the only advantage it presents is that it furnishes transportation for the litters to the field. At the time of the battle none of our transportation which was on the *Port Albert* had arrived. Two privates of the hospital corps remained with me throughout the advance under a most severe frontal and flank fire, assisting me in dragging and carrying the wounded to the shelter of the irrigation ditches which seamed the plain and in which the troops took shelter. These men, Privates Thomas Hamilton and Julius C. Heinze, were recommended by me for a certificate of merit. They also assisted me in having Capt. E. V. Bookmiller removed from the field. After our advance had stopped and the troops were sheltering themselves in the ditches, I concluded to take Captain Bookmiller off the field, as he was so wounded that he had to be held up in the water in the ditch, and the men who were holding him up were becoming exhausted. I was also desirous of making arrangements for the prompt removal of the wounded from the field to the hospital and for their refreshment at the collecting station. I therefore returned with the captain to the main gate of the mud wall and established a station behind the wall, just outside the gate. First Lieut. Charles E. Marrow, assistant surgeon, took my place on the firing line and remained there until the withdrawal of the troops, about 8 p. m., and who, on their withdrawal, brought the wounded with them. In the meantime I had sent for and received a number of “gold medal” cots, malted milk, beef extract, and several cases of mineral water for the thirsty, as the water obtainable was practically poisonous. By 12 o'clock midnight every wounded man was in hospital and on a bed in Tientsin. The “gold medal” cot makes a good litter, and when the patient arrives at the hospital has his bed with him, but it requires six men to carry it, as the hinges in the middle will give way unless supported on both sides.

In this battle 18 men, including Col. Emerson H. Liscum, were killed and 78 wounded out of about 420 engaged. The details above mentioned left First Lieut. Charles E. Marrow and myself as surgeons, available for duty during the battle, and 2 acting hospital stewards and 6 privates, as 2 had been detached for duty with two companies on detached service the afternoon of the 12th. Assisted by Assistant Surgeon Marrow, we examined the wounded as they arrived at the collecting station and gave them such refreshment as seemed necessary previous to sending them into the hospital, where Dr. Oliver D. Norton, of the Navy, had gone to receive them. I also sent Contract Surg. W. W. Calhoun into the hospital to assist Dr. Norton, he having reached the battlefield in the afternoon with the Third Battalion, which came up too late to participate. Assistant Surgeon Marrow and myself remained on the battlefield with our battalions, as it was thought that either our forces would renew the attack at daylight or that we might be attacked by the enemy. Early the morning of the 14th one battalion of the Ninth Infantry entered the Walled City, it having been found that the enemy had evacuated during the night.

Finding that the Marine Hospital was too crowded with wounded, I took possession of the Tientsin Hotel and moved all the wounded officers over to that building, including the wounded officers of the Marine Corps. The regiment was quartered about 1 mile from the nearest of the two hospitals occupied, and as quite a large number of sick were present with the regiment, this necessitated the establishment of a dispensary there. Thus the necessities of the situation required the personnel of the medical department to be divided into 3 portions, and, even with the small number of hospital orderlies with the marines, was inadequate to render proper service to 95 wounded (27 marines wounded), beside attending the sick. This difficulty was overcome by asking for details from the regiment, which worked in the wards under charge of Hospital Corps men. Ice in abundance and boiled water was obtained by me for both hospitals. Our transportation did not arrive until several days after the battle, but I believe there are few instances where wounded have had to undergo less hardships than on this occasion.

On July 19, the wounded officers of the Ninth Infantry were sent to the *Solace* of Taku, with proper medical attendance and supplies, viz: Maj. James Regan, Capt. Chas. R. Noyes, adjutant, Capt. Edwin V. Bookmiller, First Lieut. Louis B. Lawton, and First Lieut. Frank Schoeffel, who was suffering from dysentery. Six enlisted men were sent to the *Solace* on July 21 and 48 on July 24, these patients being sent to the *Solace* under direction of the commanding officer of the American forces in China. All the sick requiring hospital treatment were moved to the Tientsin Hotel and the joint occupation of the marine hospital ceased, but some marine officers still remained in the Tientsin Hotel. One of these was Lieutenant Leonard, who was not in condition to be moved. On July 21 I found it necessary to operate on Lieutenant Leonard, and the left arm was amputated by me at the shoulder joint, by Esmarch's operation. Some wounds became infected from the fact that it was necessary to shelter the wounded in irrigating ditches on the battlefield, and the filthy water soaked some of the dressings. The Mannlicher makes a wound similar in character and effect to the Mauser, and some rather remarkable instances occurred of men shot through the thoracic, abdominal, and pelvic cavities without resulting suppuration or apparently serious effects. A number of our men were hit by shrapnel and these wounds, even flesh wounds, were of a serious nature, lacerating and bruising the soft tissues and comminuting bones, and most of them became infected.

This regiment having served about eighteen months in the Philippines, was very much run down and in extremely bad condition for field service, many of the men suffering from various forms of malarial poisoning and chronic dysentery. Three days before landing every man was given 1 gram of quinine each day, and with a marked decrease in the number of cases of intermittent fever, and comparatively few cases have since developed. I think this measure as a prophylactic one is of decided value, and in this case was tried on about 1,200 men. On July 26, 215 men of the Ninth Infantry were present sick. This did not include 61 patients left on the *Logan* or the wounded. The number steadily increased, and it was readily seen that a base hospital should be established at that point of at least three or four hundred bed capacity, with the necessary complement of nurses and surgeons independent of the regimental organization. After the arrival of the cargo of the *Port Albert*, about July 16, the work of conducting the hospital was much easier, as we were then provided with the use of 1 escort wagon and 4 ambulances, and also had an accession of 1 surgeon, namely, Contract Surg. Fred M. Barney. On July 27 the Fourteenth Infantry began to arrive, and brought with them medical supplies for 5,000 men for three months. With this regiment were five surgeons, namely, Capt. and Asst. Surg. W. F. Lewis, First Lieut. and Asst. Surg. E. R. Schreiner, Contract Surgs. Robert N. Winn, H. N. Van Kirk, and C. F. Dickenson.

Immediately after the battle of Tientsin, when it was necessary to keep the operating table in use day and night, and with a hundred or more wounded in hospital, including the marines, Surgeons Norton, Steg, and Gunnel, of the Navy, rendered most valuable assistance. The sick report continued steadily to increase, and on August 1 there were 46 sick in hospital and 192 in quarters, and nearly all suffering from diarrhea or dysentery. On July 30 Maj. Gen. Adna R. Chaffee, United States Volunteers, took command of all the American forces at Tientsin, and under the provisions of General Orders, No. 3, Headquarters China Relief Expedition, dated Tientsin, China, July 30, 1900, I became chief surgeon of the China Relief Expedition. I had recommended that Tientsin be selected as the location for the base hospital, contrary to the course pursued by the allies, for the reason that our supplies were there; that it would be a halfway place when the army advanced on Peking; that after the wounded had recuperated at the base hospital they could be carried on junks direct to the hospital ship *Relief*, which had been cabled for at my request prior to the battle of Tientsin, and was expected soon, thus making it unnecessary and undesirable to establish a hospital at Taku. Paragraph 2, Special Orders, No. 4, Headquarters China Relief Expedition, dated Tientsin, China, August 1, 1900, directed the establishment of a 300-bed hospital. The Tientsin Hotel hospital was in operation with a capacity of 100. In anticipation of this order the Isabella Fisher hospital had been selected for use as a base hospital, and though its capacity was much below the number of beds required, it had yard room for enough hospital tents to make up the number of beds required, and also a very comfortable dwelling house, with room for an office, wards for officers, and quarters for the surgeons on duty. There was also in connection with the hospital a building suitable in every respect for a number of contract female nurses, who were on a transport in the bay off Taku, and who had volunteered for duty in China while en route to Manila. Upon my recommendation, First Lieut. and Asst. Surg. E. R. Schreiner was put in charge of the hospital, with 2 contract surgeons from the *Grant*, 11 female nurses, 4 acting hospital stewards, and 32 privates of the hospital corps as its personnel. At the Tientsin Hotel hospital, at

the time the expedition left, Contract Surg. Fred M. Barney was in charge, and 1 acting hospital steward and 8 privates, 4 each from the detachments of hospital corps of the Ninth Infantry and Fourteenth Infantry, on duty therein. The number of female nurses was subsequently increased to 16, and 1 professional male nurse, and the number of surgeons materially increased from time to time, as shown by the appended list.

The expedition left Tientsin on the afternoon of August 4. One hundred and seventy-three men of the Ninth Infantry and 27 of the Fourteenth Infantry were left back in Tientsin sick. The American force consisted of the Ninth Infantry, 2 battalions Fourteenth Infantry, Battery F, Fifth Artillery; detachments of the engineer, signal, and hospital corps, and about 500 marines, aggregating in all about 2,500 men. The medical department was distributed and organized as follows:

Chief surgeon, Maj. W. B. Banister, surgeon, United States Volunteers; 1 hospital steward as clerk, and 1 private, hospital corps, as mounted orderly.

Ninth Infantry: First Lieut. Charles E. Marrow, assistant surgeon, United States Army, surgeon; Contract Surg. William W. Calhoun, United States Army; 2 acting hospital stewards and 11 privates, hospital corps; 2 ambulances; 8 chino litter bearers to each company (under guard to prevent their running away).

Fourteenth Infantry: Capt. W. F. Lewis, assistant surgeon, United States Army, surgeon; Contract Surg. Robert N. Winn, United States Army; Contract Surg. H. N. Van Kirk, United States Army; 2 acting hospital stewards and 12 privates, hospital corps; 1 ambulance; 8 chino litter bearers to each company.

Light Battery F, Fifth Artillery: First Lieut. Henry S. Greenleaf, assistant surgeon, United States Army, surgeon; 1 acting hospital steward and 4 privates, hospital corps; 1 push cart.

Marines: P. A. Surg. George A. Lung, United States Navy; P. A. Surg. George D. Costigan, United States Navy; Asst. Surg. Joseph C. Thompson, United States Navy; 2 naval hospital apprentices; 1 cart; 8 chino litter bearers to each company.

One four-mule escort wagon was assigned to the medical department. Two junks and one for the marines were loaded with reserve medical supplies and stores and were to follow by river. The medical, surgical, and detachment chests were carried in the ambulances, and arranged on each side so that they could be used as seats, or with blankets folded over them for patients unable to sit up. This was absolutely necessary, as it was imperative to have these supplies with the regiments and to follow them into action, as I knew from experience that supplies on a wagon with the train would frequently be unavailable at critical periods, though generally available at night as a reserve supply. It was utterly impracticable, with only one escort wagon, to carry an equipment for a field hospital, nor did we have the personnel to have an independent staff and nurses for a field hospital.

The first battle the Americans figured in after leaving our base was that of Yangtsun on August 6, and in this fight our casualties numbered 65. At the beginning of the fight the ambulances were stationed in the rear of the line, just out of reach of the shell fire, and as this range receded on the advance of our line, the ambulances followed up, picking up the wounded after they had received attention, and following the line of battle till filled with wounded, then going as far forward as safety permitted and unloading. They were then employed in collecting all the wounded at this dressing station, and when our troops camped were all moved to this camp by ambulances and wagons, as it was necessary that they should have protection and water, which could only be obtained in the village where the troops camped. The hospital tent and walled tent were obtained from the wagon and pitched for operation shelters, and refreshment was prepared in the way of hot beef tea, etc. The most seriously wounded were dressed first, and 11 of them gotten off that night on a junk to the base hospital at Tientsin, and all the wounded, with quite a number of sick, on the next day, thus disembarassing the command of the wounded and sick. This was a necessity, as we could not leave the field hospital for their shelter for reasons above stated, nor could we carry them with us.

The next three days the heat was fearful; sometimes 150 men being prostrated and many having convulsions. Some having convulsions and rendered unconscious would in the cool of the evening be able to walk into camp. The ambulances would be filled to their utmost capacity, and on reaching camp would return and haul until all those unable to walk were in camp. The wagon train would also pick up quite a number. Camps were established on the march at Hoshuon, Matao, and Tung Chow, and it was necessary to leave a number of sick at the camps. Contract Surgeon Van Kirk was left at Matao with sick, and subsequently all these stations were provided with surgeons. During a battle the regimental surgeons remained on the line to render first aid, except one in charge of the ambulance station. After the battle they and the men of the hospital corps were assembled at camp dressing sta-

tion to attend to the wounded—a system that was uniform throughout the campaign and worked very satisfactorily, but with larger armies and greater casualties would break down, and should not be depended on in lieu of a properly equipped field hospital with staff and personnel independent of the regimental equipment except where necessity dictates.

In the attack on the wall of Peking, August 14, there were but 11 casualties, and in the attack on the grounds of the Forbidden City, August 15, 23 casualties. The wounded were moved on August 16 to the field hospital established in a building, in the grounds of the Temple of Earth, and on August 21 were sent in ambulances to Tung Chow, the head of navigation on the Pei-ho and by junk from there to the base hospital at Tientsin. The field hospital at Peking has a capacity of 150 beds and the maximum number present at one time up to date is 141.

The great majority of men admitted to sick report during the campaign were suffering from intestinal disorders, which is the great scourge of American troops. The greatest need in our equipment at present is a medical cart that can follow each regiment as a traveling dispensary and accompany the regiment when detached. These carts form part of the equipment of the medical department, but I have never seen them provided or in use in the field. The value of the first-aid package has already been demonstrated. The orderly pouch proved defective when used by a mounted orderly as the thread holding the strap to the pouch usually broke, rendering the pouch practically useless. The strap should be riveted to the pouch. The new detached service chest proved invaluable, and I consider it the most complete and valuable article in our equipment. The new aseptic hypodermic syringes, all metal, proved very unsatisfactory, and on forcing out the contents the point would become separated from the barrel. There was a great deal of complaint about the syringes.

First Lieut. E. R. Shreiner, assistant surgeon, United States Army, was relieved of the command of the general hospital at Tientsin on August 20, by Maj. William Stephenson, surgeon, United States Army. The latter was also medical disbursing officer and purveyor. Maj. William H. Arthur, surgeon, United States Army, was appointed chief surgeon, Second Brigade, China relief expedition, Tientsin, on September 14, 1900.

The field hospital at Peking was under command of Capt. W. F. Lewis, assistant surgeon, United States Army, to whom I am indebted for most valuable assistance throughout the advance on Peking. The work of the hospital corps detachment was satisfactory, and that of Acting Hosp. Steward Arnold D. Tuttle was specially efficient, and he deserves and has earned promotion to the grade of hospital steward. On September 26, I reported for duty as chief surgeon, First Brigade, China relief expedition, and my connection with the duties of chief surgeon of the China relief expedition ceased.

Summary of casualties which occurred in the United States Army expeditionary force in China, from July 12, 1900, to September 25, 1900.

In action at	Killed.		Wounded.		Total killed and wounded.	Classified location of wounds.					Total.
	Officers.	Enlisted men.	Officers.	Enlisted men.		Head.	Chest.	Abdomen.	Upper extremity.	Lower extremity.	
Tientsin, July 13:											
Ninth Infantry.....	1	18	5	72	96	14	12	11	26	33	96
Yangtsun, August 6:											
Battery F, Fifth Artillery.....				1							
Ninth Infantry.....			1	5							
Fourteenth Infantry.....		7		51	65	12	6	4	14	29	65
Peking, August 14:											
Hospital Corps.....				1							
Fourteenth Infantry.....				8	9		1		1	7	9
Peking, August 15:											
Battery F, Fifth Artillery.....	1			1							
Ninth Infantry.....		2		3							
Fourteenth Infantry.....		3		13	23	3	4		3	13	23
About 6 miles southwest Tientsin, August 19:											
Sixth Cavalry.....				6	6	1	1		2	2	6
Total.....	2	30	6	161	199	30	21	15	46	84	199

The losses of the United States Marine Corps were: At Tientsin, July 13, killed, 4; wounded, 27; Yangtsun, August 6, wounded, 1; Pekin, August 15, wounded, 1; total killed 4, wounded 29. Total of killed and wounded of the United States forces in the Pekin relief column, 232.

Summary of deaths, period July 12 to September 25, 1900.

Classification:

Gunshot wounds, killed in action.....	32
Effect gunshot wounds received in action	14
Heat exhaustion	1
Insolation	2
Dysentery	17
Tuberculosis, pulmonary	1
Typhoid fever.....	2
Cerebrospinal meningitis	1
Suicide (gunshot wound)	1
Unknown, killed in action.....	1
Total number of deaths	72
By gunshot wounds..... per cent..	66½
By disease.....do.....	33½

Summary of the personnel of the medical department serving with the troops in China, September 25, 1900.

Medical officers	10
Contract surgeons	21
Hospital stewards	4
Acting hospital stewards.....	13
Privates	137

REPORT OF MAJ. FRANK J. IVES, SURGEON, UNITED STATES VOLUNTEERS, CHIEF
SURGEON CHINA RELIEF EXPEDITION.

PEKIN, CHINA, April 5, 1901.

I have the honor to submit the following report of the medical department of the China relief expedition for the period from September 24, 1900, to March 31, 1901, during which time the undersigned served as chief surgeon thereof.

The United States forces in China in September, 1900, consisted of 144 officers and 3,900 enlisted men of the United States Army, and two battalions, each consisting of four companies of United States marines, numbering in all about 800 men, making a total strength of approximately 5,000. Although these marines were a component part of the command, the medical officers on duty with them, who were naval officers, were not required to make the reports incidental to the Army. As these marines left China early in November, I was unable to obtain any records of sickness among them, so that all data quoted in this report pertains solely to the Army. It is presumed that these naval medical officers submitted all necessary reports to the chief of their department.

In the latter portion of September, 1900, our forces were divided into two brigades stationed, respectively, at Pekin and Tientsin, with scattered detachments along the Pei Ho at Peitsang, Yangtsun, Hoshiwu, Matao, and Tungchow, the latter being about 16 miles from Pekin and the nearest point to that city on the river. Owing to the railroad between Pekin and Tientsin not being in operation, it became necessary to ship all supplies by junks on the river, thus necessitating strong garrisons along the waterway, to which the American forces contributed its quota at the places above enumerated. The junks were towed by coolies, and as not more than 15 or 20 miles per day could be traveled it required seven or eight days to make the journey between the two cities. In December the railroad was put in operation and all supplies were subsequently shipped thereby.

Upon assuming the duties of my office I found that a base hospital of 150 beds, under command of Maj. William Stephenson, surgeon, United States Army, and known as the "General Hospital at Tientsin," had been established and was in successful operation at that place. This hospital was well equipped with an adequate quantity of all necessary medical supplies, there being on hand a sufficient reserve for expansion to 300 beds should the emergency for such arise. The personnel of this institution consisted of 7 assistant surgeons, about 40 members of the Hospital

Corps, and 15 trained female nurses. It received the sick not only from the command in Tientsin, but such severe cases from Peking and the river detachments as could with safety be transferred. In this connection I would state that the journey down the river was speedy and comfortable, and the sick thus transported were, as far as known, in no case injured by the trip. They were invariably accompanied by surgeons and suitable attendants, and everything possible done for their well-being and comfort. The hospital at Tientsin was from time to time depleted by transferring many of the sick to the hospital ship *Relief*, then at anchor at Taku. It was discontinued on November 11, as the American forces at that time had been mostly withdrawn from China, and the garrison at Tientsin had been reduced to two companies of infantry.

The condition of the command in Peking in September was such as might invariably be expected after the rough and trying experiences to which it had been exposed. What was designated a field hospital had been located in one of the large buildings in the Temple of Agriculture. It was under command of Capt. W. F. Lewis, assistant surgeon, United States Army, and a certain degree of organization had been effected. The sick were segregated and a diet kitchen established. There were in use a number of "Gold Medal" cots, which had been furnished by Captain Ramsay, regimental quartermaster of the Ninth Infantry. In addition to these, a few hand litters were used as cots, but some of the sick were obliged to sleep on the floor, as the cots and litters were inadequate for all, there being about 150 sick in the hospital at that time. There was no hospital bedding, clothing, nor furniture. The sick were forced to wear the clothing in which they entered the hospital, but there was a fair allowance of blankets and Chinese bedding to render them comparatively comfortable. Major Stephenson was directed by wire to ship at once a suitable amount of bedding, clothing, and other necessary supplies from his surplus stores, which, upon their arrival, relieved the most pressing wants until the permanent hospitals were established.

The War Department having decided upon the strength of the command to remain in China during the winter, I was directed by the commanding general of the China relief expedition to make suitable arrangements for the care and accommodation of the sick of a command of about 2,000 for one year. Of this force, two companies of infantry were to garrison Tientsin, the post being designated Liscum Barracks, one company at Tungchow, and the remainder to take station in Peking. The garrison in Peking was divided into three sections, the military post known as "Camp Reilly," situated in the Temple of Agriculture, and two detachments, each consisting of two companies of infantry, doing police and provost duty in the two American sections of the city, one in that portion known as the "Tartar," and the other in the "Chinese" city.

The Temple of Agriculture is a large oval inclosure situated in the extreme southern section of the Chinese city, surrounded by a massive brick wall 15 or 20 feet in height with only two gates or entrances, and inclosing about 300 acres. The ground is elevated above the surroundings, is well drained, and in no place are the city residences in juxtaposition to the wall. The inclosure is divided by walls into five or six smaller inclosures, and in the center are situated the altars, temple buildings, and residences of the priests and caretakers. The ground is covered with grass, and there are groves and avenues of cedar trees, many of great age and proportionate size. This site was selected by the commanding general shortly after the military occupation of Peking, for the use of the American forces, and for hygienic and military reasons a more desirable location could not have been fixed upon.

Medical supplies.—During October an immense quantity and assortment of medical supplies arrived from San Francisco and Manila. These were intended to equip a medical supply depot in China, to be under the charge of Maj. E. T. Comegys, surgeon, United States Army, who had reported for duty in September. Owing to the withdrawal of a large portion of the troops, this station was never established. Such of these supplies as were needed for the command were sorted out and retained, and the balance, by direction of the commanding general, turned over to the quartermaster's department for shipment to the medical supply depot in Manila. The selection and separation of these supplies was attended with serious difficulty, owing to the absence of any marks or lists by which the contents of many of the boxes and packing cases could be determined. Such information is usually shown on the packers' lists, but it has been my experience that the latter are rarely available, especially when most needed. Not only were there many packages unmarked, but I was informed that in some instances old boxes had been used, from which the marks of some previous shipment had not been obliterated. In the present instance a great deal of unnecessary labor could have been avoided had the markings on the packages shown the contents in a more definite manner. It was particularly aggravating to open box after box to find out they contained nothing that was required.

I am not familiar with the regulations governing the shipment of supplies from a medical supply depot, but would urgently recommend that each package shipped should first have every other mark carefully obliterated and then be legibly stamped with, (1) name of depot or consignor, (2) date of invoice, (3) the number, (4) name and address of consignee, (5) contents, (6) the red cross. It has been suggested by Maj. J. C. Byron, depot quartermaster in Pekin, that where packages contain a miscellaneous assortment of articles, tin envelopes with a movable flap or lid be securely attached to the box. The box is marked as above enumerated, with the exception of the list of contents, and into these envelopes cards can be inserted containing all the above data, including a complete list of contents. For a long shipment, three or four or more similar cards to be placed in each envelope, so that one can be retained by each quartermaster through whose hands the consignment passes. This would enable each to keep an accurate check on every article received and shipped by him, and would be of great service to the medical officer ultimately receiving them. Should any article be removed from the case, a note to that effect could be made on the card. The clerical work incidental to manifolding the cards could be easily reduced by means of the mimeograph or other manifolding appliances. Shipping quartermasters have informed me that the red cross mark on the package has proved most valuable in enabling a rapid separation of medical from other property, especially when the shipment is large and supplies from other departments are mixed together. In the case of boxes it should always be placed on the two ends, so as to be visible when they are piled in tiers.

Hospitals.—On September 27, 1900, I addressed a letter to the adjutant-general, urging the immediate establishment of permanent hospital arrangements for the command in Pekin, and submitted plans for the conversion of some of the Chinese buildings in the Temple of Agriculture into a hospital of 150 beds. These plans were such as to render it easy to expand or contract the size of the hospital, should the occasion for such arise. With some alterations these plans were adopted, and what was officially designated as "United States Military Hospital No. 1" was established. This hospital had a fixed capacity of 85 beds, which could be increased to 100 by crowding, and still further enlarged as above mentioned by occupying adjacent buildings, should the necessity present itself. It was imperative that the sick be provided for before the advent of the winter season, and as there was no time to construct suitable wards, it became necessary to utilize such Chinese buildings as were available for hospital quarters. These buildings, owing to their peculiar construction, were poorly adapted for such purposes unless materially altered. They were constructed of massive walls, were closed on all sides except toward the front, and the interiors consisted in each case of one large hall extending to the roof. The two buildings utilized for wards were respectively 30 and 32 feet in depth and about 25 feet in height from the floor to the center of the roof. The roofs were of the curved, sloping design peculiar to all Chinese buildings. The fronts of these buildings had no windows, but consisted of a continuous series of doors about 3 feet wide and 8 feet in height, so that the entire front could, if desired, be thrown open. The main difficulty, therefore, was to provide for suitable heating, lighting, and ventilation. The doors above mentioned were not made of solid wood, but were constructed of an open lattice work, covered on the inner side with white paper. This system of using lattice work covered with paper for doors, windows, and even entire sides of buildings is largely in vogue in China, and seems to serve a very useful purpose. It is cheap, the heat in winter time is retained, and considerable light admitted.

In the present instance all these doors, except a few retained for egress and ingress, were closed and securely sealed. In every alternate one a glass window 3 by 3 feet was inserted, which could be opened when desired. Suitable partitions were then erected to divide the interiors to suit the requirements, and 11-foot ceilings constructed. These ceilings were entirely of Chinese design and conception. They consisted of a light bamboo or reed framework, upon which a layer of brown paper, and over this one of ordinary wall paper, were pasted. Although of the flimsiest character, they proved most serviceable, provided due care was exercised in preventing sudden drafts from without. On one occasion during a high wind an outside door was held open, which caused such a strong draft that the entire ceiling of one ward was torn from its fastenings and lifted several feet, resulting in its almost complete destruction. By observing proper precautions this did not occur again. By thus cutting off the spacious lofts above the wards the latter were most comfortably heated by excellent coal stoves furnished by the quartermaster's department. The wards were ventilated by means of the windows, and every 15 feet along the center of the ceiling there was an opening 18 inches square. In the loft there was an opening about 1 foot square every 15 feet just below the eaves, and at each end, very near the angle of the roof, a window about 18 inches in diameter, which could

be opened or closed by means of cords worked from below. By these means the ventilation was at all times good. All the interior walls were hung with white wall paper of a neat pattern, which made the wards and other rooms present a bright, cheerful, and attractive appearance. An 8-foot inclosed brick passageway was constructed, connecting the two main buildings, which being properly heated, served also as a recreation and smoking room for the convalescent patients. A sink, with earth closets, which could be emptied from without, was also constructed, opening from the passageway.

A building originally intended for a laundry was built in the southeast angle of the court, but was ultimately utilized as a dining room for the detachment and such patients as were not subsisted in the diet kitchen. Another building was suitably partitioned and utilized for administration purposes and quarters for the medical officers. The enlisted men of the detachment of the hospital corps, like all enlisted men attached to Camp Reilly, occupied hospital tents within the hospital inclosures. Two isolation wards made of hospital tents were erected in the southwest corner of the inclosure, but no occasion arose for their use.

This hospital was excellently equipped with a full assortment of medicines, surgical dressings, and hospital stores of all kinds. The folding field furniture was used in the wards and proved most servicable, with the exception of the folding cots with woven-wire mattresses. In most cases these were frail and became easily broken, being inferior to the adjustable folding cots with canvas bottoms. The "Gold Medal" cot was not used in this hospital after the other cots were received, but it proved one of the most useful and serviceable articles issued to our troops. Too much can not be said in praise of this cot for troops in the field, and for a movable field hospital I do not believe any other can compare with it for compactness, lightness, and strength. The new model, which stands higher from the ground, is a decided improvement, especially for hospital purposes.

The operating room was excellently equipped and lighted by means of a large window cut in the south side of the main building. The new mess chests, with service for 100, were used in the dining room. This chest gave the utmost satisfaction. The kitchens were plentifully supplied with all necessary culinary apparatus, and the field ranges furnished by the Quartermaster Department, which were used by all the troops, proved most excellent. I mention these details merely to show that our sick received almost the same care and comfort which would be possible in any of our military hospitals in the United States.

This hospital was commanded by First Lieut. H. S. Greenleaf, assistant surgeon, United States Army. Under him were 3 assistants, about 40 members of the hospital corps, and 6 trained female nurses. The diet kitchen was admirably managed, and everything was done conducive to the welfare of the sick. I do not believe it would be amiss to state that the United States Military Hospital No. 1, in Pekin, was, in point of equipment, the most complete hospital among the allied forces in north China, and it reflected in the most favorable manner upon the Medical Department of the Army. Lieutenant Greenleaf proved himself an efficient and capable officer, and a large part of the success of this hospital was due to his untiring energy and ability.

Military Hospital No. 2 was located in the American section of the Chinese city. Its capacity was 30 beds. It was originally intended for officers and selected cases among the enlisted men. At the time of the withdrawal of the troops in November, 1900, it was under discussion whether or not some of the female nurses then at Tientsin be retained in China during the winter. As there were no accommodations for them in the Temple of Agriculture, it was determined to establish a small hospital in the city where they could all reside and those on duty at hospital No. 1 be each day sent to that place. The plan at first appeared a little cumbersome, but it worked smoothly. The services of these nurses proved most valuable and contributed much to the efficiency of the department. This hospital, under the efficient management of Contract Surg. J. T. Halsell, United States Army, proved of great service and more than fulfilled its original requirements. It was located in the building used by the Canton Club and received the sick from the provost guard. It was discontinued as a separate organization in the latter portion of February and its personnel attached to hospital No. 1.

A 20-bed post hospital was established at Liscum Barracks in Tientsin, and a 6-bed hospital at Tungchow.

Sanitary conditions.—Owing to the apparently total lack of all sanitation on the part of the Chinese, and the indescribably filthy condition of their towns and cities, the sanitary environments at first presented a discouraging outlook. The surface drainage is crude, and although there is no sewer system a few imperfectly constructed underground drains were observed. All trash and refuse is usually thrown into the street,

where it is liable to remain undisturbed indefinitely. In a Chinese house but little garbage exists and that is usually thrown into the streets and devoured by dogs, which are plentiful and seem the natural scavengers. There are apparently no water-closets in the private houses. In all the better classes of residences a small oblong hole about a foot in depth is dug in some secluded angle of the inclosure. This is emptied from time to time, the contents being carried by coolies to a public dumping ground. These privies are used by the women and children, and only in the better class of people by the men. Throughout the city public inclosures are located for "defecatorios." These are used by the poorer classes of men and boys, who merely use the ground, as there are no privies, seats, or even sinks. When the ground in these becomes impassable for pedestrians the night soil is collected and taken to the dumping grounds. Toward the outskirts of the city these "defecatorios," as they were designated, cease to exist, and the male population utilize vacant lots, angles in the walls, and even the public highways. The night soil is considered a valuable asset for fertilizing purposes, and it is therefore not difficult to arrange for its removal. It is collected in certain outlying sections (the dumping grounds previously referred to), where it is piled, awaiting its ultimate transportation to the country. This system is extremely crude and indescribably offensive, and although it may not be the means of contaminating the drinking water, it affords every facility for conveying disease through the medium of flies and dust.

The experiences of the past three years in Cuba and the Philippines, however, have to a large extent familiarized the American Army with the most efficient methods of dealing in such cases, so within a reasonably short period those sections of Pekin controlled by our troops were in a comparatively clean condition.

Quarters.—The troops stationed at "Camp Reilly" in Pekin were housed in tents, all others occupied Chinese houses, which had been previously thoroughly cleaned and put in proper condition for habitation. Considerable discussion arose in the early fall as to the risk of subjecting troops, so lately from the Tropics, to so rigorous a climate with only canvas as a shelter, and many were the forebodings as to the direful results of such a procedure. The undersigned, as chief surgeon, did not see fit to submit recommendations against the occupying of tents, as he believed it was better to remain in the Temple of Agriculture, regardless of the character of shelter to be provided. Had there been opportunity to erect suitable barracks in the inclosure there would have been no argument, but the winter was approaching and skilled labor was difficult to procure, so that the question sifted down to remaining in the Temple of Agriculture under canvas, or occupying Chinese quarters in the thickly settled portion of the city. The former course was adopted with the most gratifying results. Considerable inconveniences and personal discomforts are unquestionably engendered by tent life, but in the present instance these were minimized as far as possible. The tents used were the walled conical, made of drab canvas. I believe that drab or other dark color is unsuitable for ordinary camp use. The interior of the tent is too dark, causing unnecessary discomfort for the occupants and making it more difficult to keep clean. The tents were heated by Sibley stoves converted into coal stoves by erecting an ovenlike base of brick about 3 feet square and 18 inches high. The central portion was hollow, opening above and to the front. An iron grate was fixed in the upper opening and the stove rested over this, being sunk about an inch into the cement top of the oven. These stoves worked admirably and maintained as comparatively even a temperature as is possible under canvas. A few fires occurred, but none of a serious character. One occurred in the hospital, in the tents used by the medical officers for their mess. In this case four hospital tents were consumed, with almost all their contents. The fire spread so rapidly that but little could be removed. The rapid destruction of these tents indicated very clearly to my mind that tents should never be used for housing the sick in winter time unless no other shelter is available, as in case of a fire it would be impossible to remove those inmates unable to escape unassisted. In the present instance the canvas was extremely dry, owing to the extreme dryness of the atmosphere. Still, it must be borne in mind that even in moderately humid climates the heat from the stoves soon dries the canvas most thoroughly and renders it very inflammable.

Bedding and clothing.—All our troops were supplied with "Gold Medal" cots. The clothing was adequate and suitable for the climate. For troops serving in the field a khaki uniform made of some suitable woolen fabric would be more serviceable than the regulation blue. The latter is kept neat and clean with difficulty. In camp it soon becomes dirty and unsightly, and gives the entire command a slovenly and discreditable appearance.

Food.—The subsistence department was abundantly provided, not only with all the component parts of the ration, but with a large assortment of extra supplies. Native beef and mutton were readily procurable. The quality of this meat, although

inferior to the corn-fed beef from our packing houses, compared favorably with the average range cattle of the plains. Considerable rinderpest existed among the cattle in the vicinity of Pekin, and at one time some cases appeared in the commissary herd, but as far as could be ascertained all so diseased were killed, and if any escaped detection and were issued no injurious results followed. Besides the beef and mutton, poultry and eggs were cheap and plentiful. An excellent bakery was established, and an abundance of well-baked, wholesome bread was available. For service in North China the ration as now authorized is excellent in every particular, as is well testified to by the healthy condition of the command and the few cases of digestive diseases.

Water.—All drinking water in Pekin was obtained from wells, the water level being about 30 feet below the surface. These wells are thickly scattered throughout the city, and as there is absolutely no attempt at sewerage one would infer that most of them would be contaminated. Although many unquestionably were, still, where sufficiently removed from adjacent residences, the water in many seemed wholesome. All the water is hard and loaded with salts. In some wells it was found quite brackish to the taste, in others sweet and agreeable. An analysis made for me in the laboratory of one of the German military hospitals of the water taken from a well in the Temple of Agriculture showed an abundance of chlorides and other salts, but no organic matter. In the Temple of Agriculture the water was at first obtained from two wells in the compound ultimately occupied by Military Hospital No. 1, but subsequently the depot quartermaster dug three other wells, as the supply from the first two was inadequate. The water in all was of the same quality, and from the five wells an abundance was obtained for all purposes.

Five distilling plants, each with an alleged capacity of 600 gallons per day, were provided for the expedition. Of these one was put in operation in the fall and another later on in the winter, orders being issued and enforced, requiring the water from these plants to be used for drinking purposes by all troops at headquarters and at Camp Reilly. Shortly after the first plant was erected it was reported to my office by a medical officer that the water was not being properly distilled, but flowed from the coils in almost the same condition as when leaving the well. The matter was at once, and repeatedly afterwards, brought to the attention of the authorities and referred to the depot quartermaster, under whose supervision the plants were being operated, but without material results. The command in the meanwhile used the water as issued, with no noticeable ill effects, a fortuitous circumstance due to the remoteness of the wells from all sources of contamination. Although no evil result followed, it was, nevertheless, unfortunate that after all the expense and trouble incidental to transporting these plants to China they should not have served their legitimate purpose.

Bathing facilities.—The two distilling plants mentioned in the previous paragraph, although distinct failures in so far as furnishing distilled drinking water is concerned, served a most useful purpose in heating the bathrooms and water for bathing. Two commodious buildings adjacent to the men's quarters were obtained and fitted up with facilities for supplying baths for about 20 men each. The distilling plants were located in these, the fire from the boilers rendering the interior temperature of the room warm and comfortable. By turning steam into large caldrons kept filled with water direct from the well an abundance of warm water for bathing was available.

Climate.—The climate of North China during the winter season is bracing, invigorating, and well calculated to produce robustness and healthfulness. The atmosphere is extremely dry, and there is no sudden variation in temperature. From November 1, 1900, to April 1, 1901, there was no rainfall and only two very light falls of snow. There were no facilities for taking maximum and minimum temperatures, but observations were taken and recorded at military hospital No. 1, of the temperature at the hours of 7 a. m. and 7 p. m. During the month of January the maximum temperature thus observed was $+35^{\circ}$ F., and the minimum $+2^{\circ}$; the average morning temperature was $+16^{\circ}$, the average evening temperature $+20^{\circ}$. As this month was the coldest during the winter, the above figures give a comparative idea of the daily temperature. Owing to the aridness of the atmosphere and absence of precipitation, the ground becomes very dry, and the soil being alluvial is soon ground into a fine powder along the roads and thoroughfares, few of which are paved. This section of China is visited every few weeks by severe winds of several days' duration. As a result, dust storms of indescribable severity are developed, and constitute one of the most insanitary conditions of Pekin, in addition to causing great bodily discomfort and annoyance. In each case after a storm of this character the sick report materially increased, the additional causes of admissions being affections of the respiratory organs, including pneumonia and bronchitis. Being appointed on

a sanitary commission, in conjunction with medical officers from other branches of the cooperating forces, the purpose being to devise measures for the proper sanitation of the city of Pekin, I brought this matter into prominence, recommending most urgently that means be adopted for street sprinkling. This was subsequently done, resulting in the greatest benefit to all the foreign residents.

Health of the command.—During that period of the military occupation prior to October 1, 1900, the sick report, although large, was in no manner excessive when the severity of the campaign and attending circumstances are taken into consideration. Many of the troops actively engaged, having previously been on duty in Cuba and the Philippine Islands, were necessarily debilitated and proper subjects for disease incidental to a campaign. Digestive diseases, including diarrhea and dysentery, led all others with a total of 2,426 cases, or 43.5 per cent of all. Malarial fever came next with 651, or 11.6 per cent. Accidents and injuries, 577, or 10.3 per cent. Respiratory, 568, or 10.1 per cent. Venereal, 451, or 8 per cent. Cutaneous, 360, or 6.4 per cent, and the others scattering. There was but 1 case of measles and 77 of typhoid fever. All of these latter occurred in the summer and fall, except three, which developed in December. Of the 353 cases of dysentery 351 occurred prior to December 1, and of the 1,710 cases of diarrhea 1,602 occurred prior to November 1. Under the heading accidents and injuries, 258 cases out of a total of 577 occurred during August; these included 14 killed and 100 wounded during the campaign from Tientsin to Pekin and 100 cases of heat exhaustion on that march.

During the winter an excellent opportunity was afforded for meeting the medical officers of the various armies and observing the equipment and organization of their departments. In all cases the medical officers were courteous and cordial in their manner and gave the impression of being men of intelligence and ability.

Equipment.—After a careful examination of the equipment of the various forces in China, I have no hesitation in asserting that the medical department of the United States Army is the best and most intelligently equipped of any service there represented.

Ambulances.—With the exception of the United States the Germans were the only contingent having an ambulance for the transportation of the sick. The British had a two-wheeled vehicle, the "tonga," also known as a "dhanjiboy," used by the Indian troops, which could transport about four in a sitting or semi-reclining position. This was drawn by two animals and was well adapted for a rough, hilly country, but did not present especial advantages over an ordinary ambulance. A comparison as to the relative merits of the American and German ambulances, according to my idea, is absolutely in favor of the former. Our wagon is considerably lighter and in emergency can be handled by two instead of four animals, which is hardly possible with the German. The seating capacity of both is the same, but in an emergency we can load six reclining patients, whereas the other has reached its limit with four. In the German ambulance the seats are arranged somewhat similar to our old-style ambulance, and when in use are rather unstable and rickety. For reclining patients they use the regulation hand litter, four of which belong to each vehicle. It is difficult to conceive of a more simple, compact, and practical method than our present arrangement of making the seats and back serve as litter beds. Unfortunately the ambulances actually in use by our army in Pekin were old, dilapidated, and out of date, so that we were not in a position to demonstrate our superiority except by explaining to our visitors what improvements had been made.

The hand litter in our Army is, for strength, lightness, compactibility, and comfort the superior of any seen in China. The British troops were supplied with what is known as the "dhoolie" litter, of which there are several varieties. The ordinary dhoolie used by the Indian troops weighs 71 pounds. It consists of two A-shaped frames, between which the litter bottom is stretched, suspended at the apex to a large bamboo pole, by means of which the litter is carried upon the shoulders of the bearers, usually four in number. When resting on the ground, the prolongations of the A serve as legs, and a curtain or hood is hung on the framework above the patient to protect him from the sun or rain. There have recently been two modifications to this litter, the Ames and Kay dhoolies. Each reduce the weight to 50 pounds. In the former there is an arrangement by which the litter bottom can be reversed and used as a hammock. The Kay dhoolie can be carried either by hand or suspended to a pole. In the mountainous regions of India, where coolie labor is plentiful and cheap, these litters undoubtedly serve a most useful purpose, but I do not believe them practical in ordinary warfare.

When it may be necessary to carry the sick or wounded a great distance and no wheel or horse transportation is available, I believe this can be accomplished with less difficulty by means of a litter suspended from a pole and carried on the shoulders of the bearers rather than by hand. This would be especially true in locations where coolie or other cheap native labor can be obtained. Our litter might readily be con-

verted into one of this kind by adopting some simple device such as a set consisting of two iron rings 3 or 4 inches in diameter, upon each of which is attached by a closed loop two iron rods, each terminating in a circular ring of sufficient size to fit over the handles of the litter. This would be packed or carried detached from the litter until required for use.

The German litter is heavy and cumbersome and presents no single feature for special commendation. That used by the French army is in many respects similar to the German, but has wooden legs and does not seem as strong or durable.

The Japanese have two litters—a light stretcher without legs, consisting of two bamboo poles, with iron braces and a canvas litter bottom; the second is what they call a "rickshaw" litter, being nothing more than an ordinary "rickshaw" with a sufficiently long body to permit the patient to rest in a half reclining position. Although the Japanese have never had practical experience with these rickshaw litters in actual warfare (those in China were received after the active campaign was ended), I believe they will prove most useful, and the question of experimenting with them in our service would be well worth the effort. The Japanese hand litter is nothing more than a light stretcher, and, having no legs, can only be used for the actual transportation of the sick or wounded. They are admirably adapted for use on the battlefield to transport the wounded from the firing line to the dressing stations, but otherwise do not compare in strength, utility, and comfort to the litter in our service.

In this connection I would state that several years ago the undersigned gave considerable attention toward devising a light stretcher for field use, and at the annual meeting of the Association of Military Surgeons of the United States, held in Washington in May, 1894, he read a paper on that subject, at the same time exhibiting a bamboo litter which he believed might answer the purpose. I still am of the opinion that such a stretcher would be a valuable adjunct to our field equipment in ordinary civilized warfare, the chief advantages being that a large consignment of litters could be rapidly pushed to the front, thus obviating the necessity of improvising, which has practically been shown to be not only a slow and laborious progress but in many instances an impossibility.

First aid packages.—All of the troops of the various cooperating forces were supplied with first-aid packages more or less similar to that in use in our service, although none were as complete. The Japanese contains 1 triangular bandage, 3 compresses of gauze, and a safety pin; the German 1 bandage, 2 gauze compresses, 1 safety pin; the British, 1 piece macintosh 12 by 6, 1 gauze bandage about 12 feet in length, 1 compress. In the British Indian service there is also a triangular bandage; the French, 1 charpie enveloped in gauze, 1 bandage, 1 compress, and 2 safety pins; the Italian, 2 gauze compresses, 1 bandage, and pins. By comparing the contents of these various first-aid packages I believe that the one adopted for our army is superior. The contents of ours seems of better quality than most, and although somewhat more bulky, I believe that the additional articles thus furnished more than counterbalance the slightly increased weight and size.

Hospital corps pouches.—In addition to the first-aid packages the members of the hospital corps of the various foreign contingents were equipped with pouches carried by a sling over the shoulder and containing a specified list of medical supplies. These pouches in many respects resembled that furnished our army, and I observed no feature worthy of special commendation. In the French army, however, they use saddlebags for the cavalry service. In this connection I would invite attention to the fact that the slings for our pouches have been reported as not sufficiently secured. This has been especially observable with mounted men, the jolting of the horse causing one or both fastenings of the sling to give way, which on the march is a most serious defect, there being no means of making the necessary repairs, and the pouch is thereby rendered useless. The French saddlebags present many advantages, but it should be borne in mind that in actual warfare a man is frequently separated from his horse, and when a command is fighting dismounted members of the hospital corps on duty with it should be at or near the firing line. In this case the pouch slung over the shoulder would be of greater service.

Medical and surgical chests.—In the Japanese service each battalion is allowed one set of chests, two in number, a medical and surgical. These panniers are constructed of wickerwork, inclosed in a strong leather case. They are somewhat larger than those in our service, but the contents are, in my opinion, not nearly so complete. The French have a set of four panniers for each regiment, the arrangements and contents of which do not present any special feature for remark. They are constructed of wickerwork and are practically obsolete. The British medical chests comprise a set of ten, of equal size and about the same dimensions as ours. This set is one of the component portions of what is known as a "section," which is actually one-

fourth of a field hospital. Each field hospital has a capacity of 100 beds, and the entire personnel and equipment is specified in regulations. The hospital is subdivided into four sections, each identical in personnel and equipment. The field hospitals are numbered from one upward, and the four sections are designated as A, B, C, D. The section is therefore an independent 25-bed hospital. The chests and everything pertaining to the equipment of the section are distinctly marked, "Field Hospital, No. —," "Section A," as the case may be. The contents of the chests are in many respects obsolete; there is very little idea of compactness and some of the British medical officers admitted that for actual utility they could be vastly improved upon. Assuming that a section is about equivalent to a regimental field hospital, their ten chests in no way compare with our present regimental set, consisting of the medical, surgical, sterilizing, and detachment chests, the box of additional dressings, and the field desk. The German army was, as far as observed, not equipped with medical panniers or chests of any kind, their medicine wagon being apparently substituted. These wagons are of two kinds, furnished respectively for battalions and field hospitals. Of the former, one is supplied each battalion (1,000 men), and of the latter, two to each field hospital. The wagons are divided into compartments opening to the sides and rear, and are very serviceable and complete. Those for the field hospital are considerably heavier than the others, and would on ordinary rough roads require four animals, although on the smooth roads of the continent two might be sufficient. The interior arrangement consists principally of a series of drawers resting on the side and slid into the bed of the wagon by small rollers. These drawers, when pulled out, present the appearance of small cabinets about 3 feet square, open at the front. They are rather elegant in design, and when arranged around a room in two rows, one above the other, give very much the appearance of a well-appointed dispensary. The contents are well secured, the bottles are square and arranged in slots on shelves, so that the danger of breaking is slight. The medicines in these wagons are principally tabloids, and the dressings are well selected and of good quality. There was considerable dispensary paraphernalia, such as mortars and pestles, etc., which in their various compartments looked very well, but I believe the space thus employed might be better utilized. The tabloids are more bulky than those in our service, and in nearly every case had the name and quantity of the drug printed on each tabloid. This wagon has the advantage of enabling a larger and more complete assortment of medical supplies to accompany each command. Its chief disadvantage is that should one or more of the animals assigned it die, become sick, or be arbitrarily withdrawn by the commanding officer, the entire fabric goes to pieces, which might not necessarily be the case with a set of chests.

Transportation for field medical supplies.—In this respect I believe the United States Army is inferior to the German, British, Japanese, French, and possibly many others. In our service the Medical Department, being dependent for the transportation of its supplies entirely upon the Quartermaster's Department, is seriously handicapped and frequently made subject to criticism which should not justly be laid at its door. When a regiment goes into active service, a certain portion of the medical supplies, in addition to what is carried by the men, should at all times be in touch with the troops and available for use at short notice. These supplies should include the medical and surgical chests, additional dressings, litters, and such other articles as may be designated by the Surgeon-General as belonging to a regimental equipment. The German medicine wagon fulfills these conditions, but in the French and Japanese services each regiment is furnished with a small one-horse vehicle on two wheels, for the sole purpose of carrying these supplies. Such a wagon can be so constructed as to readily follow troops in all but the most difficult mountainous country, to be sufficiently strong to stand the usual wear and tear of the service, and light enough to require but one animal on ordinary roads. The Japanese wagon was small, low, and moderately broad, constructed very much on the plan of railroad station trucks for handling baggage.

At present in our service the medical chests, litters, and other necessary articles are packed securely in one of the wagons of the regular wagon train, which is possibly miles in the rear and never available in case of emergency. I believe a light wagon as above described would prove far more serviceable than pack animals, unless the troops were operating in a country impassable for wheel transportation of any kind. Another important element is that the Geneva Convention does not recognize the quartermaster's transportation, and troops on the firing line should be provided with a distinctive wagon bearing the red cross, which could not under any circumstances be diverted by commanding officers to illegitimate uses. As a matter of fact, this should apply to all medical transportation, but it is especially applicable to the wagons under consideration.

The Russian troops withdrew from Peking before an opportunity was afforded to

inspect their equipment, but one article used by them on the march struck me as most serviceable in times of actual warfare. This was a large, circular metal caldron with a closed lid, having a capacity of 25 or 30 gallons, supported on wheels, the bottom of the caldron being 10 or 12 inches from the ground. This was easily drawn by one horse or mule. It is used for making soup or stew. In the Santiago campaign such an apparatus for our troops would have been of incalculable benefit.

Military hospitals.—Although the various hospitals in Pekin were originally organized as field hospitals in the strict sense of the term, when the permanent garrisons were established efforts were made to equip the individual hospitals to as high a standard of perfection as possible.

The Germans had two field hospitals of 200 beds each and a marine hospital of 100 beds. These were located in Chinese buildings in sections of the city convenient to their troops. The general equipment, as compared to the United States Military Hospital No. 1, was crude. The cots were of iron and folded in the center, making a rather unwieldy and weighty package 3 by 3 feet, of such a nature as to be difficult to transport and pack. I saw no effort to provide other folding furniture, and the bedside stands, tables, chairs, and benches seemed to have been rather roughly extemporized. Some mattresses were in use, although bed sacks filled with straw were employed to a considerable extent. There seemed to be a good allowance of blankets and bed linen of suitable quality. All patients not in bed were required to wear hospital clothing made from material resembling bed ticking. The kitchen was well and systematically regulated; in it was hung a large blackboard from 4 to 5 feet square, lined and ruled in white paint with the vertical columns for the various kinds of diet, and the number of each ward on the horizontal lines. This served as an excellent general guide for the cooks. The quality and quantity of the food was good, but in no way compared to the commissary department of our army. The wards were well ventilated and heated by means of large brick ovens constructed in each. A bathroom was attached to each ward, and the arrangements for removing the nightsoil were sanitary. Each hospital was provided with an excellently equipped operating room. Excellent disinfecting plants were established in each for bedding, clothing, etc., and also a well-equipped bacteriological and chemical laboratory. In these last two respects the Germans were superior to any of the forces in Pekin, including our own; but otherwise our equipment was in every way more serviceable and complete. After the United States, the Germans came next in point of hospital equipments. I endeavored to ascertain the extent and character of the prevailing diseases amongst them, but their medical officers seemed unwilling to impart information. However, in going through their wards, the large number of cases of typhoid fever and dysentery was apparent to the most casual observer; in fact, at times an entire ward, with 20 or more patients, seemed affected with these diseases. As my visits were made during February and March, when there were practically no typhoid and dysentery amongst the American troops, it would look as if our sanitary measures were superior, both of the above being preventable diseases.

The personnel of a German field hospital consists of 6 commissioned medical officers (the senior with the rank of major), 1 chief steward (who seems to rank higher than the hospital stewards in the United States Army, being, I should judge, similar to the highest warrant officers in the Navy), 11 noncommissioned officers, 12 nurses, privates, 1 wagon master, 18 men (laborers), 1 bookkeeper, 1 druggist—a total of 6 commissioned and 45 enlisted men.

British.—The British had but one hospital in Pekin, situated in a new and spacious compound known as the Chee Foo palace. With the exception of a limited number of iron cots and bedding, this hospital had practically no equipment beyond that of the regulation field hospital. It consisted in part of two field hospitals of four sections each, thus affording separate organizations for the native Indian and British troops. The division is essential in that service with mixed commands, owing to caste prejudices and the necessity of preparing the food in certain ways for the natives. The British hospital was clean, well ventilated, and the usual sanitary regulations enforced. Their kitchen and mess equipment seemed deficient, and no system nor arrangements for special diets for the sick were noticed.

There did not appear to be an unusual amount of sickness amongst the British and native troops, the character of diseases among the former being very similar to that amongst the Americans. I believe smallpox broke out amongst them, but only a few cases occurred, and no epidemic was even threatened. A very singular feature about the native troops is their apparent immunity from typhoid fever. Although totally unaccustomed to the vigorous climate of north China, they seemed to stand the winter well, and comparatively few succumbed to pneumonia and other pulmonary diseases.

Japanese.—The Japanese had 2 field hospitals of 200 beds each. These were arranged very much on the order of the German, but were not so comfortably

equipped. The cots were principally extemporized and the bedding, clothing, etc., of a crude quality. Their operating room was provided with an excellent assortment of surgical instruments, belonging to the field equipment. One of the principal diseases amongst them was beri-beri. There were some cases of typhoid. I do not believe they suffered as extensively from diarrhea, dysentery, and digestive diseases as the European and American troops. This would be easily accounted for, from the similarity of the food and natural conditions of the country.

Organization.—As the Medical Department of the United States Army is practically without any specific organization, they were in that respect different from any of the allied forces in Pekin.

A careful study of the various organizations reveals the fact that whereas they are for the most part suitable for coherent masses of large bodies of troops, they are not well adapted for the scattered detachment service, such as our Army is liable to perform. The problem then arises, Can a system be devised which can be readily convertible to both conditions? The British system is very similar to that in our Army with the addition of the regularly organized and equipped field hospitals previously mentioned. This latter gives them a certain mobility which is sadly lacking in our service. For instance, when the various brigades of British troops were ordered from India to China, the commanding general in his order merely designated that such and such field hospitals (giving numbers) should accompany the command. This was all that was necessary, and a few words expressed what in our service would have required much previous thought and calculation to effect.

The Japanese organization is on a more elaborate scale than others. Each regiment has 6 medical officers, 3 hospital stewards, 12 privates of the hospital corps, and 48 assistant stretcher bearers (4 from each company) detailed from the line. In addition to these there is a sanitary corps of 500 men for each division. This is usually under command of a field officer of the line and is divided into 2 companies of 250 men each. One of these companies carry the wounded from the first dressing stations to the second line, known as the "collecting stations," and the second company carry them from there to the field hospitals. This force of hospital men comprises over 6 per cent of the total command.

In the German army there are 6 medical officers with each regiment, 2 to each battalion. One noncommissioned officer of the hospital corps is assigned to each company, and 4 men from each company are designated as company bearers. In addition to this, each division has one company, consisting of 6 medical officers and 100 enlisted men, who act as litter bearers. This company has 8 ambulances and 72 litters. It advances as near as possible to the firing line without unnecessary risk, and there establishes stations, to which the wounded are brought by the company bearers. The sanitary corps then takes charge and transports the wounded to the rear. In addition to the above, each division has 6 field hospitals of 200 beds each. A division consists of 4 infantry regiments of 3,000 men and such artillery and cavalry as may be assigned it.

Each French regiment has 4 medical officers and 12 enlisted men of the hospital corps, 1 to each company. As in the German and Japanese services, company bearers are detailed from the line. The wounded on the firing line are carried to the first dressing stations and from there to what is designated their ambulance stations. Here the function of the company bearers cease. These ambulance stations are in reality temporary field hospitals, with a capacity of about 50 patients. There is apparently only one of these ambulance stations to a division. Still farther to the rear there are, for an army corps, 6 field hospitals of about 100 beds each. Behind these are the general and base hospitals. I was unable to obtain figures as to the complement of officers and enlisted men for these various hospitals, but inferred from remarks of the medical officers that the strength of the hospital corps was about 4 per cent of the total strength of the command.

It is thus seen that in the principal foreign armies the system of company bearers seems to be generally adopted. I inquired as to the use of musicians for hospital purposes on the battlefield, but was unable to obtain much satisfaction.

To minutely relate all one's observations and impressions during this remarkable period would require more space than the limits of an ordinary report would warrant. I have therefore endeavored to restrict my remarks to what appeared to me the most salient features, and as such respectfully submit them.

In conclusion, I would state that the conduct of the medical officers and enlisted men of the hospital corps of our army was such as to reflect credit upon the department. Their duties were performed in a thorough and efficient manner, as was amply demonstrated in the admirable results obtained. These results brought the medical department prominently forward as an evidence of the efficiency of the United States Army, and enabled it to contribute its quota to the laurels won in the presence of the combined armies of the world.

PREVALENCE OF SPECIAL DISEASES.

SCARLET FEVER, DIPHTHERIA, MUMPS, MEASLES, ETC.

Cases of scarlet fever, diphtheria, and cerebrospinal fever were, as usual, rare among the troops. Measles and mumps were, on the other hand, of quite frequent occurrence. In the United States measles had an admission rate of 11.36, the mean annual rate for the previous decade having been 8.46 per thousand of strength. The infection of this disease was imported into the Philippine Islands on almost every transport. The admission rate for volunteers in these islands was 8.18 per thousand of strength, and for regulars 1.61. Similar rates prevailed as regards mumps.

REPORT OF EPIDEMIC DISEASES ON THE UNITED STATES ARMY TRANSPORT *KILPATRICK*, DATED MANILA HARBOR, MAY 13, 1901, BY CONTRACT SURGEON JOHN P. KELLY, UNITED STATES ARMY.

I have the honor to forward the following report of the recent outbreak of epidemic diseases on board the U. S. army transport *Kilpatrick*:

Measles made its appearance on board April 5, 1901, in the case of a private of Company G, Fifteenth Cavalry; other cases followed in rapid succession. Several of the patients stated that the disease prevailed at the Presidio of San Francisco and Angel Island, Cal., at the time of their departure from said places to join the *Kilpatrick*; anyway, there were about eight or ten of the patients in the incubative stage of the disease when they came on board this ship.

Variola was the next infectious disease to make its appearance in the case of a private of Company M, Eleventh Infantry, a recruit enlisted March 22, 1901, at Minneapolis, Minn. He arrived at San Francisco, Cal., April 1, 1901, and was sent on board the *Kilpatrick* April 5, where he was admitted to hospital April 6. Another case of variola was admitted to hospital April 7, that of a private of Company M, Eleventh Infantry, a recruit enlisted March 26, 1901, at Oklahoma City. He arrived at San Francisco, Cal., March 30, and was sent on board the *Kilpatrick* April 5, 1901. Both of these patients stated that variola prevailed at their places of enlistment at the time of their departure to join the troops at San Francisco, Cal. One stated that variola was very prevalent at Oklahoma City while he was there. He also said that while working in that city just previous to enlisting he would often meet cases of variola on the streets while going to and from his work; that the city authorities at first tried to quarantine certain smallpox districts, but that the disease became so widely disseminated and was of such a mild type that the people did not think it of enough importance to take to their bed and be treated; deaths due to the disease were rare. Taking the statements of these two patients, together with the fact that they were the only ones on board to develop the disease at that time, and considering the incubative stage (twelve to sixteen days) of the disease, I hardly think there is any reason to doubt that these men were infected at their places of enlistment. The third case of variola was that of a sergeant of Company I, Eleventh Infantry, admitted to hospital April 24, 1901. This man was no doubt infected by the previous cases.

Mumps next manifested itself in the case of a private of Company M, Eleventh Infantry, admitted April 11. Patient stated that the disease prevailed at the Presidio of San Francisco, Cal., where he was stationed previous to joining the transport *Kilpatrick*, April 5, 1901.

No other case of mumps followed this until April 28, when a second case appeared, followed in rapid succession by several others.

Measles progressed until April 26, at which time it began to decline gradually. Treatment was as follows: Acetanilid for high temperature, diaphoretics to assist in bringing the eruption well to the surface, regulating the excretory channels, liquid diet, and rest in bed. For variola: Removal to isolation ward, immediate vaccination, acetanilid for high temperature, chloral hydrate and bromide of potassium for restlessness; room darkened; plenty of ventilation; inunction with ichthyol ointment, 1 dram to the ounce of petrolatum spissum; nutritious diet, and rest in bed.

Mumps continued to increase until five or six days before reaching Manila, P. I. Treatment: Regulation of the excretory channels, rubbing the swollen glands with camphorated oil, in some instances using equal parts of glycerin and alcoholic extract of belladonna; lead and opium lotion in cases of orchitis.

The means used to prevent the further spread of these diseases were immediate

isolation of patients along with their effects, fumigating by the burning of sulphur, and the walls and floors scrubbed with 1 to 500 bichloride of mercury solution. The quarters of the troops were thoroughly fumigated and disinfected. Vaccination of all on board not previously vaccinated and revaccination of those not exhibiting satisfactory and recent cicatrices. Rigid inspections of the entire ship daily and the laws of hygiene enforced to the letter.

Below will be found a list of patients transferred to the United States Marine-Hospital Service quarantine and detention station at Honolulu (between the dates April 13 and 21, 1901, respectively) while quarantined off the harbor of the above-named place. A second list gives the total number of cases of infectious diseases originating on board since leaving San Francisco, Cal., April 5, until anchoring in Manila Bay, May 12, 1901.

Transferred to United States Marine-Hospital Service quarantine and detention station at Honolulu.

	Cases.
Measles.....	29
Smallpox.....	2
Mumps.....	1
Lobar pneumonia.....	2
Urinary fistula.....	1

to pass through this detention station to United States Army hospital at Honolulu for treatment.

List of cases of contagious and infectious diseases originating on board since leaving San Francisco, Cal.

	Cases.
Smallpox.....	3
Measles.....	31
Mumps.....	32
Lobar pneumonia.....	2

Total..... 68

No death occurred on board during the voyage. The *Kilpatrick* anchored in Manila Harbor at 7 p. m., May 12, 1901.

REPORT OF CAPT. FRANK P. KENYON, ASSISTANT SURGEON, UNITED STATES VOLUNTEERS, ON MEASLES AND MUMPS ON THE TRANSPORT HANCOCK, DATED MANILA HARBOR, APRIL 18, 1901.

On March 25, 1901, I sailed from San Francisco, Cal., on the U. S. army transport *Hancock*, in charge of four troops of the Sixth United States Cavalry and four companies of the Seventh United States Infantry, composed of 14 officers and 885 enlisted men. On March 28, four days out, 2 cases of measles were discovered, one in the cavalry and one in the infantry. These cases with their effects were promptly placed in the isolated hospital and all commanding officers were instructed to notify their medical officers of any indisposition among the troops. On reaching Honolulu, March 31, these cases were transferred to the military hospital at that place.

On April 9, twelve days later, 3 cases of measles developed; and from April 9 to 12, 24 other cases appeared, about equally divided between the cavalry and infantry. These cases were promptly placed in hospital and the attendants strictly quarantined, no one having any duties about the hospital being allowed to come in contact with any other member of the ship. Up to this date no other case has developed.

Considering that measles broke out simultaneously in two distinct troops, with many new recruits on board ship, I think we were very successful in checking the disease.

Twenty-three cases of mumps also developed en route, 2 having come on board at San Francisco.

All cases of measles and mumps were promptly isolated, including their attendants. Several cases of the latter disease are still under treatment in hospital.

TYPHOID FEVER.

No epidemic of typhoid fever occurred among the troops during the year. In the Army as a whole the admission rate was 9.74 per thousand of strength and the death rate 1.63, as compared with the mean

annual rates, 5.19 and 0.56, for the ten years preceding the outbreak of the Spanish-American war. Among the troops in the United States the admission rate was 5.56 and the death rate 0.43 per thousand of strength. The largest admission rate was given by the command in China, 27.73 per thousand, and the largest death rate 2.11, by the troops in the Philippines. The smallest prevalence was reported from Cuba, 4.72 per thousand men, with a mortality of 0.92 per thousand. In addition to these, there was quite a large admission rate for fevers of undetermined causation, most of them probably typhoid fever of mild character, as these cases had practically no death rate. When these rates are compared with the admission rate, 141.59, and the death rate, 14.83 per thousand of strength in 1898, and the corresponding rates, 20.69 and 2.44 in 1899, the satisfactory record of the past year is manifest.

YELLOW FEVER.

During the calendar year 1900 there were 144 cases of this disease, 32 of which were fatal, reported from the Army, showing for the whole Army, regulars and volunteers, with a strength of 100,389 men, an admission rate of 1.43 and a death rate of 0.32 per thousand of strength. During the decade 1889-1898, the mean annual admission rate was 2.08 and the death rate 0.25 per thousand men. The cause of this gratifying decrease in the prevalence of this dangerous disease is explained, page 179 of this report, under the heading "Board for the study of the etiology and prevention of yellow fever."

MALARIAL FEVERS.

The rates for malarial disease were heavy during the year, owing to the great prevalence of these diseases in the Philippines and Cuba. The admission rate for the whole Army was 706.52 and the death rate 1.36, as compared with the mean annual rates of the decade 1889-1898, 174.29 and 0.58. The rates for the volunteers in the Philippines were: Admission, 1108.75, and death, 1.98; for the regulars, 742.82 and 1.64, respectively, per thousand of strength. Cuba followed with an admission rate of 581.35 and a death rate of 1.04. In Porto Rico and China the prevalence and mortality were relatively light. In the United States the admission rate was 166.20 and the death rate 0.05 per thousand of strength.

During the current year so much has been done in the practical application of methods for the prevention of malarial diseases, based on the diffusion of our knowledge of the means by which these diseases are propagated by infected mosquitoes, that a safe prognostication may be given of a lessened nonefficiency from these diseases in the next report of the Surgeon-General of the Army. On October 15, 1900, a circular from the headquarters Department of Western Cuba was published for the information and guidance of post commanders. It embodied the recommendations of the chief surgeon, Maj. Jefferson R. Kean, surgeon, United States Volunteers, and required action to be taken as thus recommended. The same requirements were afterwards, December 21, 1900, published in General Orders, No. 6, Headquarters Department of Cuba. These called for the use of mosquito bars in all barracks and especially in all hospitals, and for the destruction of the larvae or young mosquito, commonly known as wiggle-tails or wigglers, by

the use of petroleum on the water where they breed. According to the order:

The mosquito does not fly far, and seeks shelter when the wind blows; so it is usually the case that every community breeds its own supply of mosquitoes in water barrels, fire buckets, or undrained puddles, post holes, etc. An application of one ounce of kerosene to each 15 square feet of water once a month will destroy not only all the young but the adults who come to lay their eggs. The water in any cistern or tank is not affected in the least for drinking or washing purposes if only it is drawn from below and not dipped out. For pools or puddles of a somewhat permanent character draining or filling up is the best remedy. It is recommended that the medical officer who makes the sanitary inspection at each post be charged with the supervision of the details of these precautions.

Subsequent to this, sanitary reports from every post in Cuba made note of the relative prevalence of mosquitoes and of malarial fevers during the previous months and of compliance with the provisions of General Orders, No. 6. Special attention was always given to such places as bell traps not in frequent use, fire buckets, and generally to all accumulations of standing water which might serve as breeding places for the mosquito, even to such small collections as are found in the hoof prints of animals in soft or marshy ground. In several instances the recommendation was made that the long grass in the neighborhood of the barracks, which serves as a place of rest for mosquitoes during the day, be cut close to the ground, and in others that the officers of the post be assembled at such time and place as the commanding officer may direct to hear the views of the surgeon on the rôle played by the mosquitoes in the propagation of yellow fever and malarial diseases, and the means of suppressing these diseases.

As illustrating the benefit resulting from these measures, the chief surgeon of the department states that, for the week ending June 23, 1900, there were 34 cases of malarial fever under treatment at Rowell Barracks, Cienfuegos, while a year afterwards, during the week ending June 22, 1901, there was not a single case.

EXTRACTS FROM SANITARY REPORTS FOR MARCH, 1901, FROM CUBAN POSTS.

Rowell Barracks, Cuba, First Lieut. Albert E. Truby, assistant surgeon, United States Army.—Practically no mosquitoes. *Culex fuscatus* and *Culex pungens* only species found during past month. No recent cases of malaria. This condition due to excellent drainage and constant vigilance to prevent propagation. Oil and covers used to all standing water.

Columbia Barracks, Habana, Cuba, Maj. J. R. Kean, surgeon, United States Army.—Mosquitoes have been rare at this post until the last week, when they have been quite numerous. Breeding places in the post and vicinity have been sought for without success. Assouth winds have in the past been prevalent, during this time it is possible that they have come from beyond the inspected zone, and observations in Marianao and its vicinity are being made. Petroleum is used on all standing water on the reservation, and steps are being taken to screen all buildings occupied by the garrison as barracks and quarters, and by the sick. *Culex pungens* is the only variety found during the month. Four cases of malaria have been admitted during the month, of which only one, a civilian teamster, seems to have been a primary affection.

Pirotecnia Militar, Habana, Cuba, Contract Surg. E. B. Barnet, United States Army.—Mosquitoes are not abundant in and about this post at the present season. The most common are the *Culex pungens*, *Culex fuscatus*, and a few specimens of *Anopheles*. They come through the wind, as there are no stagnant waters in these surroundings. Crude petroleum is put in every place where water is kept. We have not had a single case of fever at this post during this month.

Headquarters of Artillery, Defenses of Habana, Cuba, Vedado, Habana, Cuba, Contract Surg. P. C. Field, United States Army.—Mosquitoes much less noticeable than same date last year. Ordinary species, but *Culex fuscatus* less frequently seen. All varieties in large numbers with south wind. No breeding place discovered within military zone of camp. Seventeenth, Twenty-second, and Twenty-fourth Companies,

Coast Artillery. Crude oil has been very carefully used at possible breeding places. No new malarial patients at this hospital during the month.

Hamilton Barracks, Matanzas, Cuba, Capt. J. Hamilton Stone, assistant surgeon, United States Army.—With difficulty a few mosquitoes can be found, but they are not troublesome. The *Culex* is the prevailing species; rarely an *Anopheles* is seen. There has been a marked reduction in the number of cases of malarial fever since existing orders have been complied with.

Yellow-fever hospital, Santiago, Cuba, Lieut. George A. McHenry, assistant surgeon, United States Army.—Mosquitoes exist at the yellow-fever hospital in varying numbers, depending largely on the direction of the wind; the yellow-fever hospital grounds are bounded on the north by an extensive marsh, an ideal breeding place for mosquitoes, and in the absence of the sea breeze they are here in immense numbers and very troublesome. They are the *Culex fasciatus* species. Water barrels and all collections of fresh water are kept covered with mineral oil and the grounds are kept hoed clean from vegetation.

Santa Clara Barracks, Habana, Cuba, Contract Surg. E. B. Barnet, United States Army.—Very few mosquitoes are found in or about the quarters of this post at present. Those seen are as a rule *Culex fasciatus*, only an occasional *Anopheles* being seen. Breeding places near post all dried up for the last three weeks. Larvæ are destroyed by covering all breeding places within 500 yards of the post with crude petroleum. Those present believed to have been carried here from inland by south winds, which at times prevail. No malaria at this post during the month.

Lieut. J. R. Devereux, assistant surgeon, United States Army, made some interesting observations on the prevalence of malarial fevers at Washington Barracks, D. C., and at the general hospital on the reservation of that post from April 1, 1900, to September 1, 1901. He shows in his report that the barracks and the general hospital are about 1,000 yards apart, but in other respects are apparently under similar conditions as regards malarial diseases. The average temperature, rainfall, and wind velocity are practically the same in both localities. In 1900, 4.4 per cent of the hospital corps detachment at the General Hospital were affected with malarial fevers while the garrison of the post had 27.3 affected. In 1901 the hospital corps men had 3.4 per cent affected and the garrison 6 per cent. In the former year the barracks rooms of the hospital corps men were well screened while those of the post were not thus protected. During the latter year the barracks of the post were screened and vigorous efforts made for the destruction of the mosquitoes on the reservation.

CONSUMPTION.

For tuberculosis of the lungs the admission rate for the year, 4.92 per thousand of strength, was much higher than the mean annual rate of the previous decade, 2.66. The rate of discharge for disability was 1.36, as compared with 1.40 for the previous ten years, and the death rate, 0.96, as compared with 0.48 as the mean annual rate for the decade. The admission rate was higher, 5.27, in the United States than in any of the other commands except that serving in China, where a rate of 7.70 was recorded. The lowest rate, 3.80, was recorded in Cuba, but this does not mean that the prevalence of consumption in the West India Islands is notably less than in the United States, for the command in Porto Rico gave an admission rate of 4.59 per thousand of strength. It is believed that the sanatorium for consumptives recently established at Fort Bayard, N. Mex., will be of great value in the recovery of incipient cases of this disease. Of 167 patients who had been under treatment an average of 5.4 months and were discharged during the year ended June 30, 1901, 10 were clinically cured, 26 were convalescent, and 73 improved.

VENEREAL DISEASES.

The admission rate for these diseases for the whole Army during the year 1900, was 133.97, and the discharge rate 2.36 per thousand of strength, as compared with 133 and 2.61 during 1899, and with 71.45 and 1.22, the mean annual rates of the decade 1889-1898. These large rates prevailed in all the commands except among the volunteer troops serving in the Philippines, the admission rate for these having been 79.94, and the rate of discharge 0.41 per thousand of strength. Among the regular troops in the Philippines the rates were respectively 138.88 and 0.96; among troops serving in the United States, 155.39 and 7.29. In China the admissions rose to 173.60, but there was no discharge for disability. In Cuba the admission rate reached 190.68, with 4.03 discharges per thousand of strength, and in Porto Rico the excessive admission rate of 367.88 was reached.

The following tabulation shows the relative prevalence of these diseases among the various commands by comparative rates of admission per thousand of strength during the year, together with the discharge rates indicating the permanent disability caused by them:

	Syphilis and results.		Gonorrhea.		Chancroids.		Total.	
	Admissions.	Discharges.	Admissions.	Discharges.	Admissions.	Discharges.	Admissions.	Discharges.
Troops in the United States.....	19.62	5.46	102.42	1.64	33.35	0.19	155.39	7.29
Volunteers in Philippines.....	10.06	.35	45.78	.03	24.11	.03	79.94	.41
Regulars in Philippines.....	14.75	.73	77.67	.23	46.46	.....	138.88	.96
Troops in China.....	9.24	.....	99.13	.....	65.23	.....	173.60	.....
Troops in Cuba.....	26.47	2.53	111.85	1.50	52.36	.....	190.68	4.03
Troops in Porto Rico.....	44.03	.92	194.04	.92	129.81	.....	367.88	1.84
Total Army.....	15.83	1.73	78.69	.58	39.45	.05	133.97	2.36

Since the close of the calendar year, reports from the chief surgeon of the division of the Philippines show these diseases to have increased materially in their prevalence. In April, 1901, they constituted 20.42 per cent of the total sickness as compared with 8.97 per cent in September, 1900. The board of health of Manila has instituted measures for the control of these infections among the women of the town, including the segregation of prostitutes in a certain part of the city and a careful system of superintendence over them. Orders have been issued directing an inspection of the troops at regular intervals, with the intention of detecting all diseased soldiers and sending them to hospital for treatment. The carrying out of these orders for the examination of all enlisted men has added to the sick list many cases that would have otherwise been treated privately and not appeared on the sick reports. Los Banos on Laguna de Bay, which has hot springs closely resembling in composition those of the hot springs of Arkansas, has been selected as a suitable place for the treatment of syphilitics, and some of these cases are now there undergoing treatment.

Similar efforts have been made in Cuba and Porto Rico to control these diseases.

In the report of an inspection of the hospital at Calamba, province of Laguna, dated February 24, 1901, Maj. L. M. Maus, surgeon, U. S.

Army, sanitary inspector of the division of the Philippines, states that although about 50 per cent of the troops in garrison at Calamba were affected with venereal diseases, only 15 cases were under treatment in hospital, some in quarters, while a large number of men treated themselves or went without medical care for the sake of preserving a clean medical record. He states that:

An examination system, with certificates, has been adopted for the women of the town, the examinations being conducted by Contract Surgeon Smith, but it has not appeared to lessen the evil. It is believed that the well women pass their certificates around to their less fortunate sisters during business hours, and hence the inefficiency of the system. The matter has attracted considerable official attention at Calamba, and the district commander has ordered the post commander to deport all women found diseased, the place of deportation and method of getting other corporations to accept them being left to the ingenuity of the commanding officers. So far nothing has been done in this regard, on account of the difficulties involved. The question is a serious one and should be solved without delay. So long as our troops remain stationed in small towns which are practically under the control of military authority, a thorough examination of public women should be required and the diseased ones sent to an improvised hospital supported by the town, until cured. Strict rules should be issued on this subject for the punishment of those who attempt to leave the hospital until pronounced well. Unless something is done immediately, from 20 to 40 per cent of troops stationed in provincial towns are liable to become incapacitated for military duty more or less from this cause.

ALCOHOLISM.

The admission rate for alcoholism in the Army as a whole during the year 1900 was 15.34 per thousand of strength, as compared with 14.49 in 1899 and with 28.67, the mean annual rate of the decade 1889-1898. Troops serving in the United States during the past year had 22.43 admissions per thousand of strength. The steady decrease of late years in the admissions for alcoholism among men of the Regular Army is a matter for congratulation. Military officers may be said to be unanimous in their opinion that this was mainly the result of the establishment of the post exchange or canteen at military posts. The following shows this gradual improvement: Mean annual admission rate of the decade ending with 1889, 56.68 per thousand of strength. Admission rate for 1889, 41.41; for 1890, 40.73; for 1891, 40.01; for 1892, 37.23; for 1893, 33.97; for 1894, 30.94; for 1895, 30.11; for 1896, 29.06, and for 1897, 27.86. In 1898 the altered conditions consequent on the Spanish-American war prevented further comparisons. There is less drunkenness among troops in active service than in a command doing garrison duty in times of peace. In the Philippines during the past year the admission rate for alcoholism among the Volunteers was 8.68, and for Regulars 12.41; for troops in China, 7.70. These statistics do not sustain the newspaper reports of drunkenness among the troops in the Philippines. In fact, medical officers report the habits of the enlisted men in the Philippines as very much the same as in the United States. Much of the evil effects of intemperance in the Philippines is attributed to the use of the native intoxicant, vino, which is a crudely distilled alcohol, causing rapid intoxication, which is readily recovered from when a moderate quantity is taken, but which, taken in excess, causes wild delirium and unconsciousness, and in habitual users induces a deterioration of the mental faculties.

A sample of this vino obtained from the factory when it was manufactured, was examined by Contract Surg. William Roberts, at the military hospital, Dagupan, P. I., and was found to contain 33 per

cent of alcohols belonging to the methyl and ethyl series, 11 per cent of the former and 22 per cent of the latter. Methyl alcohol constitutes the active poisonous agent of this mixture, and is derived from the juice of the nipa. The ethyl alcohol is produced by the fermentation of crude sugar added to the nipa juice, and is no more poisonous than the ordinary form of alcohol found in sherry wine or other grape juice fermentations. *Vino* is the first distillate of the fermented juice of the nipa plus cane sugar, and contains besides the methyl alcohol or wood spirit, traces of amyl, propyl, butyl, and other alcohols, the mixture being known under the common term fusel oil. It is always present in the first distillate of alcoholic liquors, and *vino* represents all that is bad in this respect.

INSANITY.

Of insanity 273 cases were reported, equivalent to an annual rate of 2.72 per thousand of strength. Of these cases 149, or somewhat more than one-half, were discharged from the service and sent to the Government Hospital for the Insane at Washington, D. C., for treatment. The remaining 124 cases were returned to duty at various periods after having been taken on the sick report. The admission rate in 1899 was 1.78, and the proportion of those sent to the Government Hospital formed 0.87 per thousand of the strength. The increase during the past year is explained by the nervous depression and homesickness among the relatively larger proportion of the strength of the Army serving in the Philippines. Twenty-three cases were reported from the home stations, equivalent to 1.38 per thousand of the strength; 3 cases from Porto Rico, also equivalent to 1.38 per 1,000 men; 14 cases from Cuba, equivalent to a rate of 1.61; 7 cases from China, equivalent to 3.60; 99 cases from the Regular troops in the Philippines, equivalent to 2.79, and 123 cases from the Volunteer troops in the Pacific islands, equivalent to a rate of 3.90.

DIARRHEAL DISEASES.

During the year 1897, when all the troops of the United States served at the home stations, the admission rate for diarrheal diseases was 73.77 per thousand of strength, with no death. Dysentery was a comparatively rare disease and seldom fatal. During the decade ended December 31, 1897, the mean annual rate of admissions was 91.06, and the death rate 0.06. In 1898, as a result of war service in Cuba, Porto Rico, and the Philippines, the admission rate rose to 388.62, and the increased gravity of the cases was manifested by a death rate of 1.45 per thousand of the strength. During the following year, 1899, the admission rate was 380.69, with a death rate of 2.14. During the past year the admission rate increased to 465.01 and the death rate to 6.47, on account of the relatively large proportion of the Army which was exposed to the causes of diarrheal and dysenteric diseases in the Division of the Philippines. Among troops serving in the United States the admission rate was only 96.57; in Porto Rico, 148.17, and in Cuba, 166.75, and the death rates in these commands were relatively small. But in the Philippines, among the regulars, the admission rate was 488.25, and among the volunteers, 736.05, while among the troops engaged in the dangerous campaign in China it rose to 1,266.54 per thousand of the strength. The heavy mortality rates occurred in

these commands. Among the Pacific Islands the death rate was 7.47 per thousand of strength; among the volunteers, 10.88, and among the troops of the China relief expedition, 15.92.

The following tabulation shows, in the various commands, the admission rate for acute and chronic dysentery and other diarrheal diseases, with the absolute number of cases, of discharges for disability, and of deaths referred to each of these headings. It is evident, however, from the large number of deaths attributed to diarrheal diseases other than dysentery that many cases of the latter disease must have been reported as diarrheas.

Location of troops and disease.	Admission rate per 1,000 of strength.	Number of cases.	Number of discharges.	Number of deaths.
United States:				
Dysentery—				
Acute	3.77	78		
Chronic	3	62	17	3
Other diarrheal diseases	89.80	1,858	6	1
Total	96.57	1,998	23	4
Porto Rico:				
Dysentery—				
Acute	27.52	60		1
Chronic	1.38	3		1
Other diarrheal diseases	119.27	260	5	
Total	148.17	323	5	2
Cuba:				
Dysentery—				
Acute	30.61	266	1	5
Chronic	2.42	21	1	
Other diarrheal diseases	183.72	1,162	1	
Total	166.75	1,449	3	5
Philippine Islands:				
Regulars—				
Dysentery—				
Acute	74.82	2,652	5	69
Chronic	38.85	1,377	64	165
Other diarrheal diseases	374.58	13,278	34	81
Total	488.25	17,307	103	265
Volunteers—				
Dysentery—				
Acute	93.56	2,941		136
Chronic	51.57	1,621	25	154
Other diarrheal diseases	590.92	18,575	16	52
Total	736.05	23,137	41	342
China:				
Dysentery—				
Acute	175.64	342	1	18
Chronic	49.30	96	4	13
Other diarrheal diseases	1,041.60	2,028	1	
Total	1,266.54	2,466	6	31
The Army:				
Dysentery—				
Acute	63.15	6,339	7	229
Chronic	31.68	3,180	111	336
Other diarrheal diseases	370.18	37,161	63	84
Total	465.01	46,680	181	649

PTOMAINÉ POISONING.

Two instances of ptomaine poisoning occurred in the Army since my last annual report. In one case the command affected was Company G, Twelfth Infantry, stationed at Bamban, Tarlac, P. I. Capt.

E. C. Poey, assistant surgeon, United States Volunteers, attributed the attack to certain cans of evaporated cream used in making a bread pudding for supper April 16, 1901. At 12.30 a. m., April 17, the first of the series of cases reported sick with headache, vomiting, diarrhea, muscular prostration, cold, clammy sweats, a rapid and feeble pulse, and violent cramps. By 3 a. m. there were several cases with similar symptoms. At noon 25 to 30 men were under treatment. Altogether about 40 men suffered. Many of the cases were very severe, but no death occurred.

In the other instance report was made from Fort McPherson, Ga., by Lieut. Charles C. Greer, assistant surgeon, United States Army, that on September 4, 1901, 175 men were added to the sick report suffering from ptomaine poisoning, probably due to the fact that the food used at supper and breakfast before the outbreak had been allowed to stand too long in certain metal containers. These were of a cheap variety, and had a seam around the bottom which could not be easily cleaned even when scrubbed with a stiff brush. The prevailing symptoms were nausea, vomiting, purging, severe abdominal pains, back ache, headache, fever (103° to 106° F.), rapid pulse, and general prostration. Twenty per cent of the cases were severe, and a few were extremely ill, but there was no death. Lieutenant Greer commended the hospital corps men for their efficient work during the two days of this trying ordeal.

DISEASES OF THE RESPIRATORY ORGANS.

Diseases of the respiratory organs among troops in the United States gave an admission rate of 76.48 and a death rate of 0.56 per thousand of strength, as compared with 202.34 and 1.47 in 1899, and with 102.21 and 0.69, respectively, the mean annual rates of the decade 1889-98.

Bronchitis gave a rate of 84.39 in the United States. The exposures of the troops during the active campaign in China caused a rate of 92.45, but in the islands this affection was infrequent, the rate in Cuba having been only 29.34, in Porto Rico 29.82, and in the Pacific islands, among the regulars 34.59 and among the volunteers 44.60.

Pneumonia, also, had its highest prevalence in the United States, 4.25 per thousand of strength, followed in China by a rate of 3.08, while in Cuba the rate was only 1.61, in Porto Rico 2.29, and in the Pacific islands 2.12 among the regulars and 2.61 among the volunteers. The death rate, however, from this disease was highest among the volunteer troops in the Philippines, 0.76 per thousand men, as compared with 0.25 among the regular troops serving with them and with 0.34 among the troops serving in the United States.

SPECIAL MEDICAL REPORTS RENDERED TO JUNE 30, 1901.

Name.	Rank.	Report.
Appel, D. M.	Major and surgeon	Pulmonary and laryngeal tuberculosis, clinical history. Pulmonary tuberculosis, 3 cases, thermographs only.
Arwine, Jas. T.	Contract surgeon	Syphilis.
Ashford, B. K.	First lieutenant and assistant surgeon	Copy of chapter on "Uncinariosis" written for Dr. Cabot's work on blood analysis.
Banister, W. B.	Major and surgeon	Report of the China relief expedition.
Barber, A. W.	Contract surgeon	Smallpox at Fort D. A. Russell, Wyo.
Borden, W. C.	Major and surgeon	Diphtheria.
Bradley, A. E.	Captain and assistant surgeon	Do.

Special medical reports rendered to June 30, 1901—Continued.

Name.	Rank.	Report.
Carr, L. C.	Major and surgeon, volunteers.	Santiago as a yellow-fever center.
Cattermole, C. A.	Captain and assistant surgeon, volunteers.	Vaccinia.
Curry, Jos. J.	do	Diseases of the Philippines. Malta fever. ¹
Curtis, J. W.	Contract surgeon.	Smallpox at Tagudin, Philippines.
DeKraft, S. C.	Captain and assistant surgeon, volunteers.	Hæmoglobinuric fever.
DeMey, C. F.	do	Beriberi.
DeNiedeman, Wm.	Major and surgeon, volunteers.	Abscess of liver.
Dunshie, J. F.	Contract surgeon.	Yellow fever at Guanajay Barracks, Cuba.
Egan, P. R.	Major and surgeon.	Meat ration in the Tropics. ²
Flagg, C. E. B.	Captain and assistant surgeon.	Rubella. Secondary syphilis. Typhoid fever, 2 cases.
Frick, E. B.	do	Value of blood examinations in obstetrics.
Girard, A. C.	Lieutenant-colonel and deputy surgeon-general.	Report of autopsies made during August, September, October, November, and December, 1900. Report of autopsies made during January, February, and March, 1901.
Godfrey, G. C. M.	Captain and assistant surgeon.	Yellow fever at Pinar del Rio, Cuba. May, June, and July.
Gorgas, W. C.	Major and surgeon.	Report of the work of the sanitary department, Habana, Cuba, year of 1900.
Gregory, W. G.	Contract surgeon.	Tuberculosis.
Hoff, J. Van R.	Major and surgeon.	Annual report Department of Porto Rico, June 30, 1900.
Howard, D. C.	Captain and assistant surgeon.	Scarlet fever.
Kelly, John P.	Contract surgeon.	Epidemic diseases on transport Kilpatrick.
Latimer, C. H.	do	Report relative to insane cases treated at the First Reserve Hospital, Manila, P. I.
Mason, C. F.	Captain and assistant surgeon.	Observations on diseases of the Tropics.
Morris, E. R.	Major and surgeon.	Primary dementia.
Owen, W. O.	do	Paper entitled, "Does physical law apply to the human body."
Poe, E. C.	Captain and assistant surgeon, volunteers.	Report on epidemic of gastro-enteritis at Bamban, Tarlac, P. I.
Raymond, H. I.	Captain and assistant surgeon.	Chronic dysentery.
Raynor, W. J.	Captain and assistant surgeon, volunteers.	Care of the feet in the Tropics.
Roberts, Wm.	First lieutenant and assistant surgeon.	Report on the chemistry of vino.
Shockey, M. A. W.	do	Smallpox at Fort Niobrara, Nebr.
Stearns, C. H.	Captain and assistant surgeon, volunteers.	Fernicious malarial fever.
Stone, J. H.	First lieutenant and assistant surgeon.	Typhus fever, sporadic case, Matanzas, Cuba.
Strong, R. P.	do	Mylusis, parasitic invasion of the naris.
Stunkard, Thos. C.	Contract surgeon.	Report of a case of infection with <i>Balanitidum coli</i> . Report of a case of infection with <i>Strongyloides intestinalis</i> .
Tesson, L. S.	Major and surgeon.	Paper on the general hospital, Presidio of San Francisco, Cal.
Ward, J. M.	Contract surgeon.	Folliculocytosis.
Waterhouse, S. M.	First lieutenant and assistant surgeon.	Beriberi. General tuberculosis.
Whitney, W.	Major and surgeon, volunteers.	Insanity. Pseudo-angina pectoris. Varioloid.
Wilcox, T. E.	Major and surgeon.	Smallpox on transport Kilpatrick.
Winne, C. K.	do	Typhoid fever.
Woodruff, C. E.	do	Angio-neurotic gangrene.
		Vaccination at Fort Riley, Kans.

¹ Published in the Boston Medical and Surgical Journal, February 21, 1901.² Published in the Boston Medical and Surgical Journal, March 31, 1901.

BOARD FOR THE STUDY OF THE ETIOLOGY AND PREVENTION OF YELLOW FEVER.

In my last annual report I referred to the appointment of a board for the purpose of pursuing scientific investigation with reference to the acute infectious diseases prevailing on the island of Cuba. This board, consisting of Maj. Walter Reed, surgeon United States Army, and Contract Surgs. James Carroll, Aristides Agramonte, and Jesse W.

Lazear, United States Army, arrived at their station, Columbia Barracks, Quemados, Cuba, on June 25, 1900, and at once proceeded, under written instructions from this office, published in my last annual report, to the special study of questions relating to the causation and prevention of yellow fever.

Fortunately for the purpose of this board an epidemic of yellow fever which had begun in the adjacent town of Quemados, Cuba, during the latter part of the month of May was still prevailing, so that an opportunity was afforded for bacteriological and pathological observations in this disease. In the course of the investigations which were assiduously carried out by the members of the board during the months of July, August, and September, the results obtained, especially as relates to the mode of propagation of yellow fever by the bite of the mosquito, were such as to warrant their publication. For this purpose permission was given to Maj. Walter Reed, president of the board, to present a preliminary report at the meeting of the American Public Health Association held in Indianapolis, Ind., October 22-26, 1900.

In its experimental work during these months two of the members of the board suffered from yellow fever as the result of having been bitten by infected mosquitoes. Dr. Lazear was bitten September 13, 1900, became affected with yellow fever five days afterwards, and died September 25, 1900. Dr. Carroll was bitten August 27, 1900, and was removed to the yellow fever wards on September 1, 1900. He suffered from a severe attack of the disease, but fortunately recovered. The conclusions of the board in its preliminary report were, first, that the *Bacillus icteroides* (Sanarelli) stands in no causative relation to yellow fever, but when present should be considered as a secondary invader in this disease; second, that the mosquito serves as the intermediate host for the parasite of yellow fever.

As these observations, if confirmed, were of the highest importance in the future prevention of yellow fever, not only among our troops stationed on the Island of Cuba, but in our Atlantic seaports, the board was directed to continue its observations, especially along the same line of investigation.

With the approval of the military governor of the island, an experimental station was established and further observations undertaken by Major Reed and his associates. A small camp of non-immune young men, mostly belonging to the hospital corps, was formed in an open field about a mile from Quemados, Cuba. After this camp had been occupied long enough to show that yellow fever in its stage of incubation was not present, five of the men permitted themselves to be bitten by infected mosquitoes. In from 3 to 5 days each of these men became the subject of a well-defined attack of the disease and was sent to the yellow-fever hospital. In a second series of experiments, four non-immunes were injected with blood from yellow-fever patients. Each of these was attacked and sent to the fever hospital, while four of the men who had suffered an attack from infection transmitted by mosquitoes manifested no bad effect from a similar injection of yellow-fever blood. The mosquito-conveyed infection had given immunity from the disease. A third series of experiments was carried out to determine whether yellow fever can be conveyed by clothing and bedding which have been contaminated by contact with yellow-fever patients and their discharges. A small unventilated hut was built, its

interior well guarded against mosquitoes by wire screens. Dr. R. P. Cooke and two hospital corps men, all of them non-immunes, passed twenty consecutive nights in this hut, sleeping in contaminated sheets and blankets taken from the beds of yellow-fever patients in the Los Animas Hospital, of Habana, Cuba. After this a fresh stock of soiled articles, including pajamas, undershirts, and nightshirts, in addition to bedding, was obtained from the fever hospital and two non-immunes occupied the room for twenty-one nights. A third time this experiment was repeated by two non-immunes for twenty nights; yellow fever was not developed in any of these experiments. Meanwhile another small hut was constructed, well ventilated and with a wire screen extending from floor to ceiling in the middle, dividing it into two compartments. Every article before admission into this room was carefully disinfected by steam. Fifteen infected mosquitoes were set free in one compartment into which a non-immune hospital corps man entered and was bitten. Four days afterwards he was removed to the yellow-fever hospital. The other compartment was occupied for eighteen nights by two non-immunes whose health remained perfect. The conclusions drawn from these experiments were:

1. The mosquito—*Culex fasciatus*—serves as the intermediate host for the parasite of yellow fever.
2. Yellow fever is transmitted to the non-immune individual by means of the bite of the mosquito that has previously fed on the blood of those sick with this disease.
3. An interval of about twelve days or more after contamination appears to be necessary before the mosquito is capable of conveying the infection.
4. The bite of the mosquito at an earlier period after contamination does not appear to confer any immunity against a subsequent attack.
5. Yellow fever can also be experimentally produced by the subcutaneous injection of blood taken from the general circulation during the first and second days of the disease.
6. An attack of yellow fever, produced by the bite of the mosquito, confers immunity against the subsequent injection of the blood of an individual suffering from the non-experimental form of this disease.
7. The period of incubation in 13 cases of experimental yellow fever has varied from forty-one hours to five days and seventeen hours.
8. Yellow fever is not conveyed by fomites, and hence disinfection of articles of clothing, bedding, or merchandise, supposedly contaminated by contact with those sick with this disease, is unnecessary.
9. A house may be said to be infected with yellow fever only when there are present within its walls contaminated mosquitoes capable of conveying the parasite of this disease.
10. The spread of yellow fever can be most effectually controlled by measures directed to the destruction of mosquitoes and the protection of the sick against the bites of these insects.
11. While the mode of propagation of yellow fever has now been definitely determined, the specific cause of this disease remains to be discovered.

Subsequent to this, and in continuation of the same line of experimental work, Major Reed and his assistants succeeded in inducing attacks of yellow fever in four other persons by means of the bites of mosquitoes that had previously bitten yellow-fever patients, thus making a total of 12 cases produced by the bites of mosquitoes. These latter cases were of special importance as showing the length of time during which the mosquito may remain capable of conveying the disease. In three of the cases the intervening period between the contamination of the insect and the production of the disease was thirty-nine, fifty-one, and fifty-seven days, respectively, thus offering an explanation of the fact that the contagion of yellow fever may cling several months to a building that has been vacated by its occupants,

or to the infected area of a town, even though the latter has been entirely depopulated.

Upon the recommendation of Major Reed further work at the experimental sanitary station near Quemados was discontinued at the end of February, 1901, and the members of the board were ordered to return to their proper station in this city, in order to give special attention to the search for the yellow-fever germ in the bodies of the infected mosquitoes which had been killed and preserved at various dates after their contamination. This investigation is still being carried on in the laboratory of the army medical school. I am very glad to be able to report that recovery took place in all patients the subjects of experimentation.

The importance and far-reaching consequences of the observations made by Major Reed and his associates at Quemados, Cuba, can hardly be overestimated. For the first time in the history of this widely prevalent tropical disease we are in possession of knowledge with regard to the manner of its propagation which will enable us, I believe, not only to check its ravages, but to effectually stamp it out whenever it may appear in any of our garrisons or cities.

With the view of promptly arresting the spread of the disease among our troops, a circular was submitted for my approval by the chief surgeon, and was published as Circular No. 5, of 1901, from the headquarters, Department of Cuba. (See p. 683.)

Already the sanitary measures which have been put in force by the health authorities in the city of Habana, based on the work of Major Reed and his associates, have resulted in absolutely ridding the city of yellow fever for the first time in more than one hundred and forty years.

EXTRACTS FROM THE PRELIMINARY NOTE OF THE BOARD FOR THE STUDY OF THE
ETIOLOGY AND PREVENTION OF YELLOW FEVER.

The first part of this preliminary note will deal with the results of blood cultures during life and of cultures taken from yellow-fever cadavers, reserving for the second part a consideration of the mosquito as instrumental in the propagation of yellow fever, with observations based on the biting of non-immune human beings by mosquitoes which had fed on patients sick with yellow fever at various intervals prior to the biting.

In prosecuting the first part of our work we isolated a variety of bacteria, but of this we do not propose to speak at present. It will suffice for our purpose if we state the results as regards the finding of *Bacillus icteroides*, leaving the mention of other bacteria to our detailed report.

The cases studied during the Quemados epidemic had been diagnosed by a board of physicians, selected largely by reason of their familiarity with yellow fever. This board consisted of Drs. Nicolo Silverio, Manuel Herera, Eduardo Angles, and Acting Asst. Surg. Roger P. Ames, and Jesse W. Lazear, United States Army.

Those studied in Habana were patients in Las Animas Hospital, and had been diagnosed as such by a board of distinguished practitioners of that city.

An examination of Table I will show the character of the attacks. The milder cases studied, few in number, were attended with jaundice and albumin in the urine.

Bacillus icteroides (Sanarelli) as the cause of yellow fever.—The claim of Sanarelli for the specific character of *B. icteroides* as the causative agent in yellow fever has excited such wide attention since the publication of his observation, that it seemed to us of the first importance to give our undivided attention to the isolation of this microorganism from the blood of those sick with yellow fever, and from the blood and organs of yellow-fever cadavers.

A. *Cultures taken from the blood during life.*—The method followed was that ordinarily used in an attempt to isolate bacteria from the circulating blood, viz, from a vein at the bend of the elbow a sufficient quantity of blood was taken with an hypodermic syringe, made sterile by boiling, and after careful cleansing of the skin with

soap and water, followed by equal parts of absolute alcohol and ether, and 1:2000 bichlorid solution.

Exceptionally, the blood withdrawn was plated on agar; but as a rule it was immediately transferred to sterile bouillon tubes (10 cubic centimeters) in quantities of 0.5 cubic centimeter to each of several tubes. These were then incubated at from 35° to 37° C. for a period of one week. They were examined daily, and if growth was observed plates were made in agar or gelatin, or both, and the colonies carefully studied by transference to ordinary laboratory media.

Eighteen cases have thus been carefully studied; of these 11 were designated as "severe" cases of yellow fever, with 4 deaths; 3 as "well-marked" cases, with no deaths; and 4 as "mild" cases, with no deaths.

From these 18 cases blood cultures were made, as shown in the following table:

TABLE I.—*Blood cultures during life.*

Day of disease.	Character of attack.	Number of cultures.	Number of bouillon tubes inoculated.	Bacillus icteroides.
First.....	Severe.....	3	14	Negative.
Do.....	Well-marked.....	1	4	Do.
Do.....	Mild.....	1	3	Do.
Second.....	Severe.....	6	18	Do.
Do.....	Well-marked.....	1	2	Do.
Do.....	Mild.....	1	2	Do.
Third.....	Severe.....	7	18	Do.
Do.....	Mild.....	2	4	Do.
Fourth.....	Severe.....	5	14	Do.
Do.....	Well-marked.....	2	6	Do.
Do.....	Mild.....	1	1	Do.
Fifth.....	Severe.....	5	12	Do.
Do.....	Well-marked.....	1	3	Do.
Do.....	Mild.....	1	1	Do.
Sixth.....	Severe.....	1	6	Do.
Do.....	Well-marked.....	1	2	Do.
Seventh.....	Severe.....	1	2	Do.
Do.....	Well-marked.....	1	2	Do.
Eighth.....	Severe.....	2	6	Do.
Do.....	Well-marked.....	1	2	Do.
Ninth.....	Severe.....	1	2	Do.

13 agar plates. 26 agar plates.

Number of cultures.....	48
Number of bouillon tubes inoculated.....	115
Number of agar plates.....	18

It will be seen that of 48 separate cultures made from the blood on various days of the disease and representing 115 bouillon inoculations and 18 agar plates we failed to find *Bacillus icteroides* in any of our tubes or plates.

The results of cultures taken in 18 cases of unmistakable yellow fever, on various days of the disease, and in some cases on every day from the onset to death or recovery, would seem to exclude the presence of *Bacillus icteroides* in the blood of these cases during life.

We have already stated that we will reserve for a later report a description of the bacteria isolated from the blood in these cases. We now remark that but few organisms were obtained, and that as a rule our blood-cultures gave no growth whatever.

B. *Cultures from yellow fever cadavers.*—We tried to obtain autopsies very soon after death, and sometimes succeeded in doing so. Tubes containing about 10 cubic centimeters of flesh-peptone bouillon were generally used for the first inoculation direct from the blood and organs. As soon as the laboratory was reached agar plates were made from these inoculated bouillon tubes, the former as well as the latter being then incubated at from 35° to 37° C. In nearly every case gelatin plates were also made from the recently inoculated bouillon tubes and kept at a temperature of 19° to 20° C.

If colonies were found in the agar or gelatin plates, on the following days the corresponding bouillon tubes were also plated on agar and gelatin. The bacteria thus found in our plates were carefully isolated and studied upon the usual nutritive media, so as to enable us to identify them, if possible. We will here content ourselves with giving the results as regards the presence of *Bacillus icteroides* only:

TABLE II.

No. of case.	Day of disease.	Time of autopsy (hours after death).	Source of culture.	<i>Bacillus icteroides</i> .
1	Seventh	2	Blood, liver, spleen, kidney	Negative.
2	Sixth	13	do.	Do.
3	Fourth	8	do.	Do.
4	Eighth	2	Abdominal cavity, blood, liver, spleen, kidney, bile, duodenum.	Do.
5	Fourth	4	Blood, liver, spleen, kidney, bile, duodenum	Do.
6	Sixth	6½	Abdominal cavity, blood, pericardial fluid, lung, spleen, kidney, liver, bile, duodenum.	Do.
7	do	4	Blood, lung, liver, spleen, kidney, bile, jejunum	Do.
8	do	4	Blood, lung, liver, spleen, kidney, urine, small intestine	Do.
9	Fourth	2	Liver, spleen, small intestine	Do.
10	Fifth	7	Liver, kidney, spleen, small intestine	Do.
11	Third	4	Liver, kidney, spleen	Do.

Our failure to isolate *Bacillus icteroides* in these 11 autopsies of yellow fever patients was a result which we had not anticipated. One of us (Agramonte), who at Santiago, Cuba, during the epidemic of 1898, succeeded in finding *Bacillus icteroides* in 33 per cent of his autopsies, has been much surprised at the absence of this bacillus in cultures from cadavers sectioned in or near Habana during the present year. In 2 of the 11 cases we had reason to believe that from the appearance of colonies seen in gelatin plates we would be able to isolate *Bacillus icteroides*. These colonies, however, when transferred to other media and carefully studied, did not prove to be this bacillus. We wonder whether other observers have occasionally relied upon the appearance of colonies in gelatin plates without further study. We only mention this as a possible explanation of the large percentage of positive results recorded by some observers.

Portier, of New Orleans, La., only succeeded, however, in isolating *Bacillus icteroides* in 3 out of 51 autopsies. (Journal of American Medical Association, April 16, 1898.)

Lutz (Revista d'Igiene e Sanita Publica, xi, No. 13, July, 1900, pp. 474-475) says as the result of his extensive observations on yellow fever that *Bacillus icteroides* can not be found by present laboratory methods in more than half of the cases of yellow fever, and that when present the colonies are few in number. It is possible that our future autopsies may give more favorable results as regards *Bacillus icteroides*.

The mosquito as the host of the parasite of yellow fever.—Having failed to isolate *Bacillus icteroides*, either from the blood during life or from the blood and organs of cadavers, two courses of procedure in our further investigations appeared to be deserving of attention, viz, first, a careful study of the intestinal flora in yellow fever in comparison with the bacteria that we might isolate from the intestinal canal of healthy individuals in this vicinity, or those sick with other diseases; or, secondly, to give our attention to the theory of the propagation of yellow fever by means of the mosquito—a theory first advanced and ingeniously discussed by Dr. Carlos J. Finlay, of Habana, in 1881. (Anales de la Real Academia, vol. xviii, 1881, pp. 147-169.)

We were influenced to take up the second line of investigation by reason of the well-known facts connected with the epidemiology of this disease, and, of course, by the brilliant work of Ross and the Italian observers in connection with the theory of the propagation of malaria by the mosquito.

We were also very much impressed by the valuable observations made at Orwood and Taylor, Miss., during the year 1898, by Surgeon Henry R. Carter, United States Marine-Hospital Service. (A note on the interval between infecting and secondary cases of yellow fever, etc., reprint from New Orleans Medical Journal, May, 1900.) We do not believe that sufficient importance has been accorded these painstaking and valuable data. We observe that the members of the yellow fever commission of the Liverpool School of Tropical Medicine, Drs. Durham and Meyers, to whom we had the pleasure of submitting Carter's observations, have been equally impressed by their importance. (British Medical Journal, September 8, 1900, pp. 656-657.)

The circumstances under which Carter worked were favorable for recording with considerable accuracy the interval between the time of arrival of infected cases in isolated farm houses and the occurrence of secondary cases in these houses. According to Carter, "the period from the first (infecting) case to the first group of cases infected at these houses is generally from two to three weeks."

The houses having now become infected, susceptible individuals thereafter visiting

the houses for a few hours fall sick with the disease in the usual period of incubation, one to seven days.

Other observations made by us since our arrival confirmed Carter's conclusions, thus pointing, as it seemed to us, to the presence of an intermediate host, such as the mosquito, which having taken the parasite into its stomach soon after the entrance of the patient into the non-infected house, was able after a certain interval to reconvey the infecting agent to other individuals, thereby converting a non-infected house into an "infected" house. This interval would appear to be from nine to sixteen days (allowing for the period of incubation), which agrees fairly closely with the time required for the passage of the malarial parasite from the stomach of the mosquito to its salivary glands.

In view of the foregoing observations, we concluded to test the theory of Finlay on human beings. According to this author's observation of numerous inoculations in 90 individuals, the applications of one or two contaminated mosquitoes is not dangerous, but followed in about 18 per cent by an attack of what he considers to be very benign yellow fever at most.

We here desire to express our sincere thanks to Dr. Finlay, who accorded us a most courteous interview and has gladly placed at our disposal his several publications relating to yellow fever during the past nineteen years, and also for ova of the variety of mosquito with which he had made his several inoculations. An important observation to be here recorded is that, according to Finlay's statement, thirty days prior to our visit these ova had been deposited by a female just at the edge of the water in a small basin, whose contents had been allowed to slightly evaporate, so that these ova were at the time of our visit entirely above contact with the water. Notwithstanding this long interval after deposition they were promptly converted into the larval stage after a short period by raising the water in the basin.

With the mosquitoes thus obtained we have been able to conduct our experiments. Specimens of this mosquito forwarded to Mr. L. O. Howard, entomologist, Department of Agriculture, Washington, D. C., were kindly identified as *Culex fasciatus*, Fabr.

In this preliminary note we have not space to refer at length to the various interesting contributions made by Finlay to the mosquito theory for the propagation of yellow fever. In addition to the paper already quoted, his most important contributions to this theory are to be found in the articles designated as follows: *Estadística de las Inoculaciones con mosquitos contaminados*, etc., reprint, Habana, 1891; *Fiebre Amarilla, Estudio Clínico Patológico y Etiológico*, reprint, Habana, 1895; and *Yellow Fever Immunity—Modes of Propagation—Mosquito Theory*, Eighth Congress of International Hygiene and Demography, Budapest, 1894.

His present views on this subject may be stated in his own language:

"First, reproduction of the disease, in a mild form, within five to twenty-five days after having applied contaminated mosquitoes to susceptible subjects. Second, partial or complete immunity against yellow fever obtained even when no pathogenous manifestation had followed these inoculations." (Medical Record, vol. 55, No. 21, May 27, 1899.)

Without reviewing the cases regarded as mild forms by the author of this theory, we believe that he has not as yet succeeded in reproducing a well-marked attack of yellow fever, attended with albumin and jaundice, within the period of incubation of the disease, and in which all other sources of infection could be excluded.

The experiments made by us on 11 non-immune individuals are embraced in Table III, which should be carefully studied. The mosquito used in all cases was *Culex fasciatus*, Fabr.

TABLE III.—*Inoculation on non-immune individuals through the bite of mosquitoes (Culex fasciatus.)*

No. of case.	Age.	Nativity.	Date of inoculation.	Character of attack.	Number of patients bitten.	Day of disease.	Time between infection of mosquito and inoculation.	Number of mosquitoes.	Result.
							Days.		
1	.....	U.S.	Aug. 11	Mild.	1	7th	5	1	Negative.
2	.....	U.S.	do	Very mild	1	5th	5	1	Do.
3	24	U.S.	Aug. 12	do	1	5th	6	1	Do.
4	20	U.S.	do	do	1	5th	6	1	Do.
5	24	U.S.	Aug. 14	do	1	5th	8	1	Do.
6	34	U.S.	Aug. 16	do	1	5th	10	1	Do.
7	22	U.S.	Aug. 18	Severe	1	2d	3	1	Do.
8	20	U.S.	Aug. 19	Very mild	1	5th	13	2	Do.
				Severe	1	1st	3		
9	28	U.S.	Aug. 25	Fatal	1	2d	6	1	Do.
				Mild	1	1st	4		
				Severe	1	2d	2		
				do	1	2d	12		
10	46	Eng	Aug. 27	Mild	1	1st	6	1	Positive. ¹
				Severe	1	2d	4		
				Mild	1	2d	2		
				Fatal	1	2d	12		
				Mild	2	2d	4, 10	1	
				Severe	2	2d, 9th	2, 8		
				do	3	1st, 2d, 2d	2, 8, 16	1	
11	24	U.S.	Aug. 31	Mild	2	1st, 2d	6, 10	1	Positive. ²
				Fatal	1	2d	12		
				Severe	1	1st	2	1	
				Mild	3	1st, 2d, 2d	4, 6, 10		
				Severe	3	All on 1st	2, 4, 8	1	
				Mild	1	2d	6		

¹ Severe attack of yellow fever.² Well-marked attack of yellow fever.

It will be seen that we record 9 negative and 2 positive results. It is, we think, important to observe that of the 9 failures to infect, the time elapsing between the biting of the mosquito and the inoculation of the healthy subject varied in 7 cases from two to eight days (Nos. 1, 2, 3, 4, 5, 7, and 9), and in the remaining 2 from ten to thirteen days (Nos. 6 and 8).

Five individuals out of the nine who failed to show any result (Nos. 2, 3, 4, 5, and 6) were inoculated by mosquitoes that had bitten very mild cases of yellow fever on the fifth day of the disease, and one individual by a mosquito that had bitten a mild case of yellow fever on the seventh day of the disease. (This latter patient was discharged from the hospital three days later.) To this fact may possibly be attributed the negative results. Of the remaining 3 negative cases (Nos. 7, 8, and 9), and which had been inoculated by mosquitoes that had bitten severe cases of the disease, the interval between the bite and the inoculation varied from two to six days.

In the 2 cases (Nos. 6 and 8) where the interval was respectively ten and thirteen days, the inoculations had been made with mosquitoes that had bitten very mild cases of yellow fever on the fifth day of the attack. No. 8 was also bitten by a mosquito which had been infected by a severe case of yellow fever three days before.

We refrain from commenting further at this time upon the 9 negative cases, preferring to record the results thus obtained rather than to indulge in speculation.

Of the two cases which we have recorded as positive in Table III, we now propose to speak at greater length.

CASE 10.

Dr. James Carroll, acting assistant surgeon, United States Army, a member of this board, was bitten at 2 p. m. August 27, 1900, by *Culex fasciatus*. This particular mosquito had bitten a severe case of yellow fever on the second day of the disease twelve days before; a mild case of yellow fever on the first day of the attack six days preceding; a severe case of yellow fever on the second day of the attack four days before, and a mild case of yellow fever on the second day of attack two days before inoculation.

Dr. Carroll remained well until the afternoon of the 29th, when he states that he felt tired, and for this reason, when on a visit to Las Animas Hospital the same afternoon (29th) some time between 4 and 6 p. m., after visiting a few patients, he left

the wards and waited outside on the porch, while his companions remained in the wards.

August 30.—During the afternoon, although not feeling well, Dr. Carroll visited La Playa, about 14 miles from Columbia Barracks, and took a sea bath.

August 31.—Dr. Carroll realized that he was sick and that he had fever, although he refrained from taking his temperature, but did visit the laboratory, distant about 140 yards, for the purpose of examining his blood for the malarial parasite. The examination was negative. During the afternoon he was compelled to take to his bed. At 7 p. m. temperature was 102° F. He had no headache or backache; only a sense of great lassitude. His eyes were injected and his face suffused.

September 1.—At 7 a. m. his temperature was 102°. Blood was again carefully examined by Dr. Lazear with negative result. At 11 a. m. temperature was 102°.

The case having been diagnosed as yellow fever, Dr. Carroll was at noon removed to the yellow fever wards. At 9 p. m. temperature was 102.8°, pulse 90; at 12 o'clock midnight temperature 103.4°, pulse 84.

September 2.—At 3 a. m. temperature was 103.6°, pulse 80. A trace of albumin was now found in the urine. The subsequent history of the case was one of severe yellow fever. Jaundice appeared on September 3.

The accompanying chart, No. 1, contains all the necessary data.

CASE 11.

X Y, aged 24, white, American, a resident of the military reservation of Columbia Barracks, was bitten during the forenoon of August 31, 1900, by the same mosquito that had bitten case 10 (Dr. Carroll) 4 days before, and which in the meantime had bitten a mild case of yellow fever (first day) 2 days before being applied to X Y.

X Y was also bitten by a second mosquito that had been applied to a fatal case of yellow fever (second day) 12 days before; and to two mild cases (second day) 4 and 10 days previously; also, by a third mosquito that had bitten a fatal case of yellow fever (second day) 12 days before; a severe case (first day) 2 days before, and three mild cases (first, second, and second day) 4, 6, and 10 days before; finally by a fourth mosquito that had bitten three severe cases of yellow fever (all on first day) 2, 4, and 8 days previously, and one mild case (second day) 6 days before. (Vide Table III.)

It will be seen that X Y was bitten by four mosquitoes, two of which had bitten severe (fatal) cases of yellow fever 12 days previously; one of which had bitten a severe case (second day) 16 days before; and one which had bitten a severe case 8 days before.

X Y began to experience a sense of dizziness and disinclination to work. This was just 5 days from the time of the mosquito inoculation; twenty-four hours later he was still dizzy and light headed in attempting to move about. During the afternoon (sixth day after inoculation) he had chilly sensations, followed by fever and restlessness during the night.

On the following day (seventh day after inoculation), 8 a. m., temperature 102.8° F., his eyes were slightly injected and his face suffused. The patient was removed to the yellow fever wards; at 9 a. m. temperature was 103° F., pulse, 66. A trace of albumin was found in the urine during the afternoon (third day of the attack). This increased during the following days. The conjunctivae were slightly jaundiced on the fourth day of the disease, which was more distinct and could be plainly seen on the anterior aspect of the chest on the fifth and following days. Bleeding from the gums was noticed on the third and subsequent days after admission. Repeated examinations of the blood failed to show any malarial parasites.

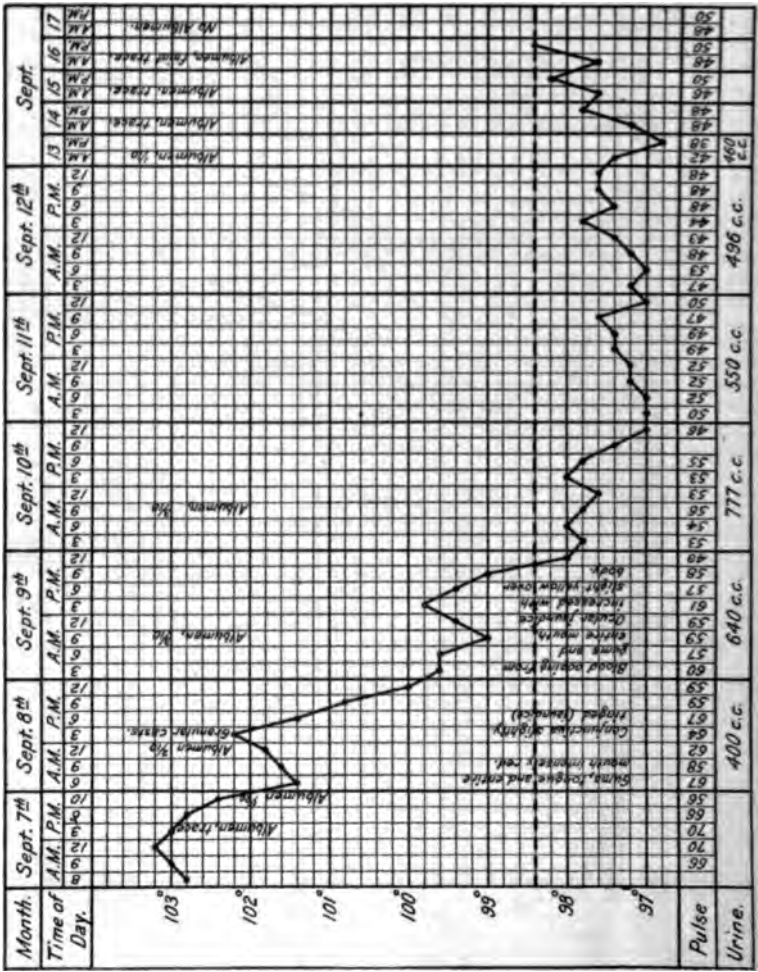
The course of the fever, the appearance of albumin in the urine, with jaundice and hemorrhage of the gums, together with the slow pulse, all pointed distinctly to the diagnosis of yellow fever. His attending physician, Dr. Roger P. Ames, United States Army, an expert in the diagnosis and treatment of this disease, did not hesitate to diagnose X Y's attack as one of "well-pronounced yellow fever." Dr. Ames was not cognizant of the method of inoculation in this case. (Vide Chart II.)

We invite attention to the fact that from August 17 to October 13, a period of fifty-seven days, only three cases of yellow fever have occurred at Columbia Barracks among a population of 1,400 non-immune Americans, and we consider it very important to note that two of these had been bitten within five days of the commencement of their attacks by contaminated mosquitoes.

We will now briefly give the history of the third case of yellow fever that has occurred at Columbia Barracks during the period August 17 to October 13, 1900.

In the light of cases 10 and 11, we consider this case of sufficient importance to be here included, especially as it is one that might be possibly designated as a case of accidental infection by a mosquito.

CHART II.—Yellow fever following, within the usual period of incubation, the bite of an infected mosquito (*Culex fasciatus*).



CASE 3.

Dr. Jesse W. Lazear, acting assistant surgeon, United States Army, a member of this board, was bitten on August 16, 1900 (case 3, Table III), by a mosquito (*Culex fasciatus*), which ten days previously had been contaminated by biting a very mild case of yellow fever (fifth day). No appreciable disturbance of health followed this inoculation.

On September 13, 1900 (forenoon), Dr. Lazear, while on a visit to Las Animas Hospital, and while collecting blood from yellow fever patients for study, was bitten by a *Culex* mosquito (species undetermined). As Dr. Lazear had been previously bitten by a contaminated insect without effect, he deliberately allowed this particular mosquito, which had settled on the back of his hand, to remain until it had satisfied its hunger.

On the evening of September 18, five days after the bite, Dr. Lazear complained of feeling "out of sorts," and had a chill at 8 p. m.

On September 19, 12 o'clock noon, his temperature was 102.4°, pulse 112; his eyes were injected and his face suffused. At 3 p. m. temperature was 103.4°, pulse 104; 6 p. m., temperature 103.8°, and pulse 106; albumin appeared in the urine. Jaundice appeared on the third day. The subsequent history of this case was one of progressive and fatal yellow fever, the death of our much-lamented colleague having occurred on the evening of September 25, 1900.

As Dr. Lazear was bitten by a mosquito while present in the wards of the yellow-fever hospital, one must at least admit the possibility of this insect's contamination by a previous bite of a yellow-fever patient. This case of accidental infection can not fail to be of interest in connection with cases 10 and 11.

For ourselves, we have been profoundly impressed with the mode of infection and with the results that followed the bite of the mosquito in these three cases. Our results would appear to throw new light on Carter's observations in Mississippi as to the period required between the introduction of the first (infecting) case and the occurrence of secondary cases of yellow fever.

Since we here, for the first time, record a case in which a typical attack of yellow fever has followed the bite of an infected mosquito, within the usual period of incubation of the disease, and in which other sources of infection can be excluded, we feel confident that the publication of these observations must excite renewed interest in the mosquito theory of the propagation of yellow fever as first proposed by Finlay.

From our study thus far of yellow fever, we draw the following conclusions:

1. *Bacillus icteroides* (Sanarelli) stands in no causative relation to yellow fever, but, when present, should be considered as a secondary invader in this disease.
2. The mosquito serves as the intermediate host for the parasite of yellow fever.

The second report submitted by the board on the etiology of yellow fever was, with my approval, read at the Pan-American Medical Congress held in Habana, Cuba, February 4-7, 1901.

THE ETIOLOGY OF YELLOW FEVER, BY MAJ. WALTER REED, SURGEON, UNITED STATES ARMY, JAMES CARROLL, AND ARISTIDES AGRAMONTE, ACTING ASSISTANT SURGEONS, UNITED STATES ARMY.

Since the publication of our preliminary note we have continued our investigations, especially as regards the means by which yellow fever is propagated from individual to individual, and as to the manner in which houses become infected with the contagium of this disease. The results already obtained are so positive and striking that, with the permission of Surgeon-General Sternberg, we have concluded to present to this Congress an additional note, in which we will record these later observations. We desire to here express our sincere thanks to the military governor of the island of Cuba, Maj. Gen. Leonard Wood, United States Volunteers, without whose approval and assistance these observations could not have been carried out.

In order to exercise perfect control over the movements of those individuals who were to be subjected to experimentation and to avoid any other possible source of infection, a location was selected in an open and uncultivated field, about 1 mile from the town of Quemados, Cuba. Here an experimental sanitary station was established under the complete control of the senior member of this board. This station was named Camp Lazear, in honor of our late colleague, Dr. Jesse W. Lazear, acting assistant surgeon, United States Army, who died of yellow fever while courageously investigating the causation of this disease. The site selected was well

drained, freely exposed to sunlight and winds, and from every point of view satisfactory for the purposes intended.

The personnel of this camp consisted of 2 medical officers, Dr. Royer P. Ames, acting assistant surgeon, United States Army, an immune, in immediate charge; Dr. R. P. Cooke, acting assistant surgeon, United States Army, non-immune; 1 acting hospital steward, an immune; 9 privates of the hospital corps, 1 of whom was immune, and 1 immune ambulance driver.

For the quartering of this detachment and of such non-immune individuals as should be received for experimentation, hospital tents, properly floored, were provided. These were placed at a distance of about 20 feet from each other, and were numbered 1 to 7, respectively.

Camp Lazear was established November 20, 1900, and from this date was strictly quarantined, no one being permitted to leave or enter camp except the 3 immune members of the detachment and the members of the board. Supplies were drawn chiefly from Columbia Barracks, and for this purpose a conveyance under the control of an immune acting hospital steward and having an immune driver was used.

A few Spanish immigrants recently arrived at the port of Habana, were received at Camp Lazear from time to time, while these observations were being carried out. A non-immune person, having once left this camp, was not permitted to return to it under any circumstances whatever.

The temperature and pulse of all non-immune residents were carefully recorded three times a day. Under these circumstances any infected individual entering the camp could be promptly detected and removed. As a matter of fact only two persons, not the subject of experimentation, developed any rise of temperature; one, a Spanish immigrant, with probable commencing pulmonary tuberculosis, who was discharged at the end of three days, and the other, a Spanish immigrant, who developed a temperature of 102.6° F. on the afternoon of his fourth day in camp. He was at once removed with his entire bedding and baggage and placed in the receiving ward at Columbia Barracks. His fever, which was marked by daily intermissions for three days, subsided upon the administration of cathartics and enemata. His attack was considered to be due to intestinal irritation. He was not permitted, however, to return to the camp.

No non-immune resident was subjected to inoculation who had not passed in this camp the full period of incubation of yellow fever, with one exception, to be hereinafter mentioned.

1. Having thus sufficiently indicated the environment of Camp Lazear and the conditions under which its residents lived, we will now proceed to a narration of the observations thus far made at this experimental station. At the time these inoculations were begun the several tents were occupied as follows: Tent No. 1 by 1 immune and 1 non-immune; No. 2 by 1 immune and 2 non-immunes; No. 3 by 2 immunes; No. 4 by 3 non-immunes; No. 5 by 3 non-immunes; No. 6 by 2 non-immunes, and No. 7 by 1 non-immune.

For the purpose of experimentation subjects were selected as follows: From Tent No. 2, 2 non-immunes, and from Tent No. 3, 3 non-immunes. Later 1 non-immune in Tent No. 6 was also designated for inoculation.

*Case 1.*¹—Private John R. Kissinger, Hospital Corps, United States Army, aged 23, a non-immune, occupant of Tent No. 2, with his full consent, was bitten at 10.30 a. m., November 20, 1900, by a mosquito (*C. fasciatus*) that had bitten a severe case of yellow fever on the fifth day, eleven days previously; another severe case, on the third day, six days before, and a third severe case on the third day, three days before. As Kissinger had not absented himself from Columbia Barracks for a period of more than thirty days, it was considered safe to inoculate him without waiting for his period of incubation to pass.

November 23, 1900, Kissinger was again bitten by the same mosquito. The result of both inoculations was negative. The mosquito, therefore, was incapable of conveying any infection on the eleventh or fourteenth day after it had bitten a severe case of yellow fever on the third day of the disease. This insect had been kept at ordinary room temperature and died November 26, 1900.

December 5, 1900, at 2 p. m., twelve days after the last inoculation, Kissinger was again bitten by five mosquitoes (*C. fasciatus*), two of which had bitten fatal cases of yellow fever on the second day, fifteen days before; one a severe case on the second day, nineteen days previously, and two a mild case on the third day, twenty-one days before.

The record of temperature and pulse, taken every three hours, following this inoc-

¹This was the first successful inoculation at Camp Lazear, and is therefore designated Case No. 1.



CAMP LAZEAR, THE EXPERIMENTAL SANITARY STATION NEAR QUEMADOS, CUBA.



"INFECTED BEDDING BUILDING" AND "MOSQUITO BUILDING," CAMP LAZEAR, NEAR QUEMADOS, CUBA

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ulation, showed that the subject remained in his usual state of health during the following three days, except that on December 8, on the third day, Kissinger had slight vertigo, upon rising, which soon passed away. At 4.30 p. m.—commencement of fourth day—he complained of frontal headache; otherwise he felt well and partook of supper with appetite; at 9 p. m., temperature 98.4° F., pulse 90; at 11.30 p. m., he awoke with a chill, temperature 100° F., pulse 90; he complained of severe frontal headache and backache; his eyes were injected and his face suffused. December 9, at 3 a. m., his temperature was 102° F., pulse 102; he had violent headache and backache with nausea and vomiting. He was then removed to the yellow-fever wards. His subsequent history was that of a case of yellow fever of moderate severity. Albumin appeared in the urine on the fourth day, increased to one-fifth by volume on the sixth day and disappeared on December 22. Granular casts were present in considerable numbers from the fourth to the eighth day. The conjunctivæ were jaundiced on the third day. The diagnosis of yellow fever in this case was made by Drs. Juan Guitéras, Carlos Finlay, W. C. Gorgas, and A. Diaz Albertini, the board of yellow fever experts of the city of Habana, who saw the patient on several occasions during his illness. (See Chart III.) The period of incubation in this case was 3 days 9½ hours.

Case 2.—John J. Moran, aged 24, an American, non-immune occupant of Tent No. 2, with his full consent, was bitten at 10 a. m., November 26, 1900, by a mosquito (*C. fuscatus*) which twelve days before had bitten a case of yellow fever of moderate severity, on the third day of the disease. This insect had also bitten a well-marked case of yellow fever (second day) ten days previously.

November 29, at 2.20 p. m., Moran was again bitten by the same mosquito. The result of both of these inoculations was negative. This insect was, therefore, incapable of conveying the infection fifteen days after having bitten a case of yellow fever of moderate severity on the third day, and thirteen days after it had bitten a well-marked case of this disease on the second day. This mosquito had been kept at room temperature. Moran's case will be again referred to when we come to speak of the infection of a building by means of contaminated mosquitoes.

Case 3.—A Spanish immigrant, aged 26, a non-immune occupant of tent No. 5, with his full consent, was bitten at 4 p. m., December 8, 1900, by four mosquitoes (*C. fuscatus*) which had been contaminated as follows: One by biting a fatal case of yellow fever, on the third day, seventeen days before; one a severe one, on the third day, eighteen days before; one a severe case, on the second day, twenty-two days before, and one a case of moderate severity, on the third day, twenty-four days previously.

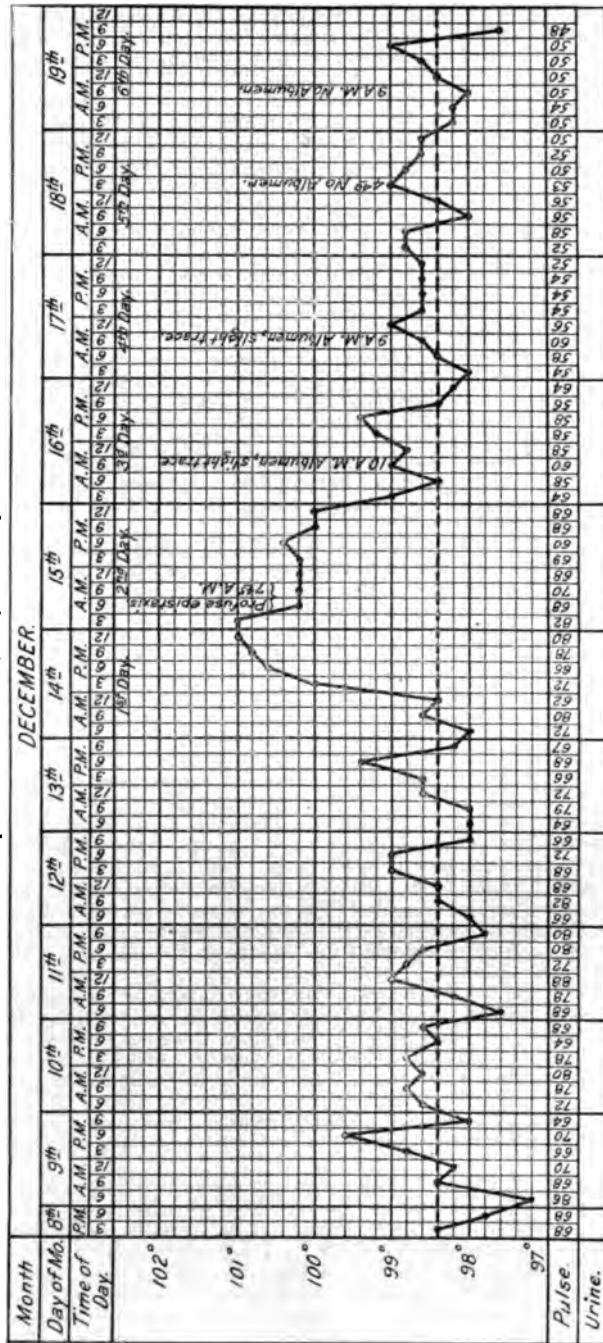
The record of temperature and pulse, taken every three hours after the inoculation, shows no rise of temperature above 99 F. until 6 p. m., December 13 (sixth day), when 99.4° F. is recorded; pulse 68. The subject, who was of a very lively disposition, retained his usual spirits until noon of the 13th, although he complained of a slight frontal headache on the 11th and 12th. He took to his bed at noon of the 13th (fifth day), complaining of increased frontal headache and a sense of fatigue. At 9 p. m. his temperature was 98.2° F., pulse 62.

December 14, at 6 a. m., temperature was 98° F., pulse 72, and he still complained of frontal headache and general malaise. Profuse epistaxis occurred at 7.45 a. m.; at 9 a. m., temperature 99.6° F., pulse 80; 1.15 p. m., temperature 100° F., pulse 80; he complained of a sense of chilliness, with frontal headache increased, and slight pain in the back, arms, and legs; 3 p. m., temperature 100° F., pulse 80; 4.15 p. m., temperature 100.7° F., pulse 68; his face was flushed and eyes congested. He was removed to the yellow-fever wards. A trace of albumin was found in the urine passed at 3.30 p. m., December 15; a few hyaline casts were also present. He was seen at this time by the Habana board of experts and the diagnosis of mild yellow fever confirmed. (See Chart No. IV.)

The period of incubation in this case was four days and twenty hours, counting from the time of inoculation to the hour when the patient took to his bed; if reckoned to the onset of fever, it was five days and seventeen hours.

Case 4.—A Spanish immigrant, aged 27, a non-immune occupant of tent No. 5, with his full consent, was bitten at 10 a. m., November 26, 1900, by a mosquito (*C. fuscatus*) which had bitten a severe case of yellow fever on the second day, ten days before. Three days later, November 29, he was again bitten by the same insect. December 2, after an interval of three days, he was again bitten by the same insect, and also by a second mosquito (*C. fuscatus*) which, twelve days before, had been contaminated by biting a fatal case of yellow fever on the third day. No unfavorable effects followed any of these attempted inoculations. The first-mentioned mosquito, therefore, was incapable of conveying any infection on the seventeenth day, after biting a severe case of yellow fever on the second day; the other also failed to infect on the

CHART IV. — Yellow fever produced by the bite of *Culex fasciatus*.
[Period of incubation, 4 days 20 hours.]



twelfth day, after biting a fatal case of yellow fever on the third day. Both of these mosquitoes had been kept at ordinary room temperature.

December 9, after an interval of seven days, the subject was again bitten, at 10.30 a. m., by one mosquito (*C. fasciatus*) which had been infected nineteen days before by biting a fatal case of yellow fever on the second day of the disease. He remained in his usual health until 9 a. m., December 12 (third day), when he complained of frontal headache; his temperature was 98.8° F.; pulse 96. This headache continued during the entire day. At 6 p. m. temperature was 99° F., pulse 94; 9 p. m., temperature 99° F., pulse 84; 9.30 p. m., temperature 99.4° F., pulse 82. Severe headache and backache was complained of; his eyes were injected and his face suffused. The following morning he was sent to the yellow-fever wards. Urine passed at 4.20 p. m., December 15, the third day, gave a distinct trace of albumin. Many hyaline casts were present on the same date. The conjunctivæ were jaundiced on the third day.

The patient was seen by the board of experts on December 14, and the diagnosis of yellow fever made. (See Chart No. V.)

The period of incubation in this case was three days and eleven and one-half hours.

Case 5.—A Spanish immigrant, aged 26, a non-immune occupant of tent No. 5, with his full consent, was bitten at 10 a. m., November 26, 1900, by a mosquito (*C. fasciatus*) that had bitten a well-marked case of yellow fever on the third day, twelve days before. November 29 he was again bitten by the same insect. December 2 he was for the third time bitten by two mosquitoes (*C. fasciatus*), both of which had bitten a well-marked case of yellow fever on the third day, eighteen days before. As no bad results followed any of these inoculations, it follows that these mosquitoes were incapable of conveying any infection eighteen days after they had bitten a well-marked case of yellow fever on the third day. Both of these insects had been kept at room temperature.

December 11, after an interval of nine days, the subject was again, at 4.30 p. m., bitten by the same mosquitoes, four in number, that had been applied to case 3, three days prior to this time, with positive results.

The record of temperature and pulse, taken every three hours following the inoculation, showed no change till December 13 (second day), at 9 a. m., when the temperature was 99° F., and the pulse 78. From this hour till 6 p. m. the temperature varied from 99.2° to 99.6° F. The subject complained of frontal headache, slight in degree, during the entire day. At 9 p. m. his temperature was 98.4° F., pulse 62.

December 14 (third day), he complained of slight frontal headache during the entire day, and was indisposed to exertion. From 6 a. m. to 6 p. m. the temperature averaged 99.2° F., and the pulse varied from 64 to 90; at 9 p. m. it was 98.4° F., pulse 78. December 15 (fourth day), at 6 a. m., temperature was 98.2° F., pulse 78. He still had frontal headache. At 9 a. m. temperature was 99.2° F., pulse 80; at 12 noon the former was 99.2° F., pulse 74. The subject now went to bed, complaining of headache and pains throughout the body. At 2 p. m. the temperature was 100° F., pulse 80; eyes much congested; face flushed. At 6 p. m. his temperature had risen to 102° F., and the pulse to 90. He was then transferred to the yellow-fever wards. Albumin appeared in the urine at 7.30 a. m., December 17. Bleeding from the gums and roof of the mouth occurred on the sixth and seventh days of his illness.

This case was examined by board of experts on the 16th and 19th, and the diagnosis of yellow fever made.

Albumin disappeared on the sixth day, the temperature falling to normal on this date, and remaining near this point till December 23, the ninth day of sickness, when a relapse occurred, attended with bleeding from the gums on December 24 and 25, with the appearance of red blood cells and pus cells in the urine in moderate numbers. Fever subsided on December 26, and the urine became normal on December 29. (See Chart VI.)

The period of incubation in this case, if reckoned from the time of inoculation to the hour when the patient took to his bed, was three days and nineteen and one-half hours.

The four patients whose histories we have given above were also examined by a number of physicians of Habana, among whom we may mention Dr. Bango, of La Cavadonga; Dr. Sanchez, of La Benéfica, and Dr. Moas, of La Purissima Concepcion, by all of whom the diagnosis of yellow fever was confirmed.

Let us now rapidly review the circumstances attending these cases of experimental yellow fever, in order to emphasize certain points of interest and importance in connection with their occurrence. (We omit any reference to the clinical histories.)

It should be borne in mind that at the time when these inoculations were begun there were only 12 non-immune residents at Camp Lazear, and that 5 of these were selected for experiment, viz, 2 in tent No. 2 and 3 in tent No. 5. Of these we suc-

CHART V.—*Yellow fever produced by the bite of Culex fasciatus.*
[Period of incubation, 3 days 11 hour.]

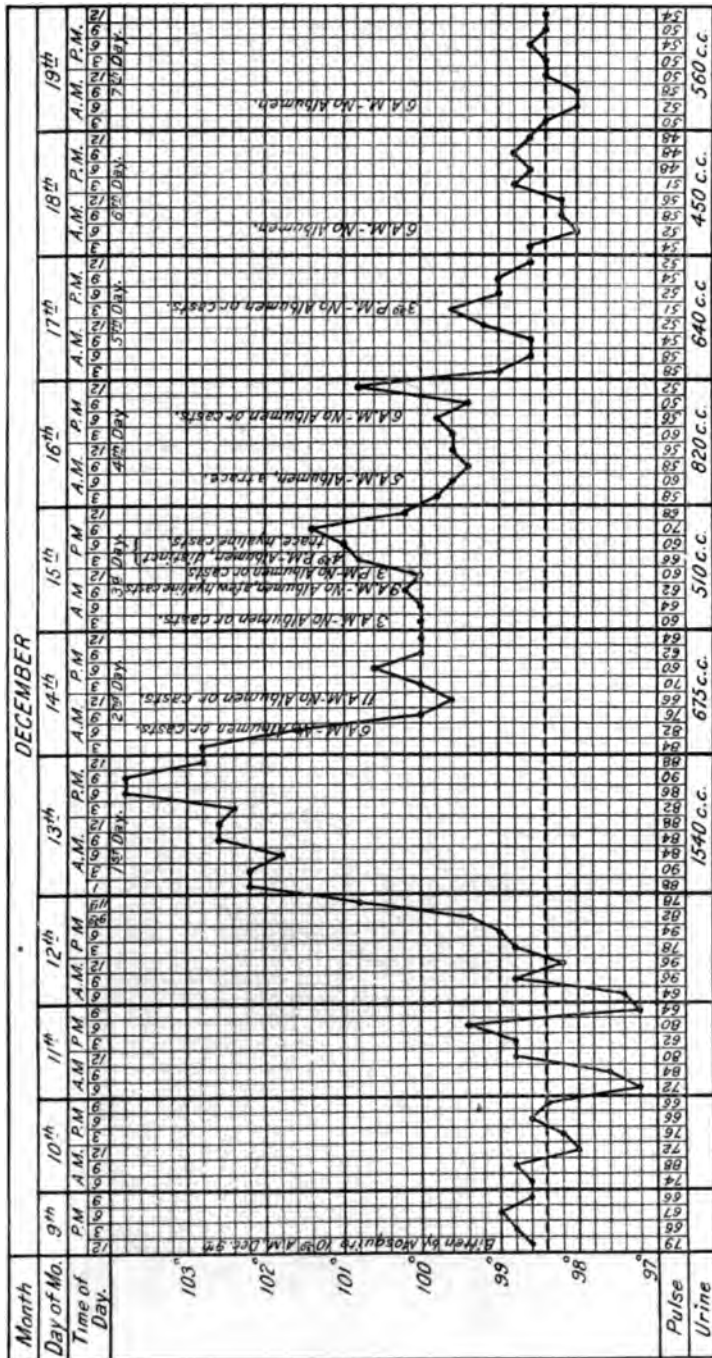
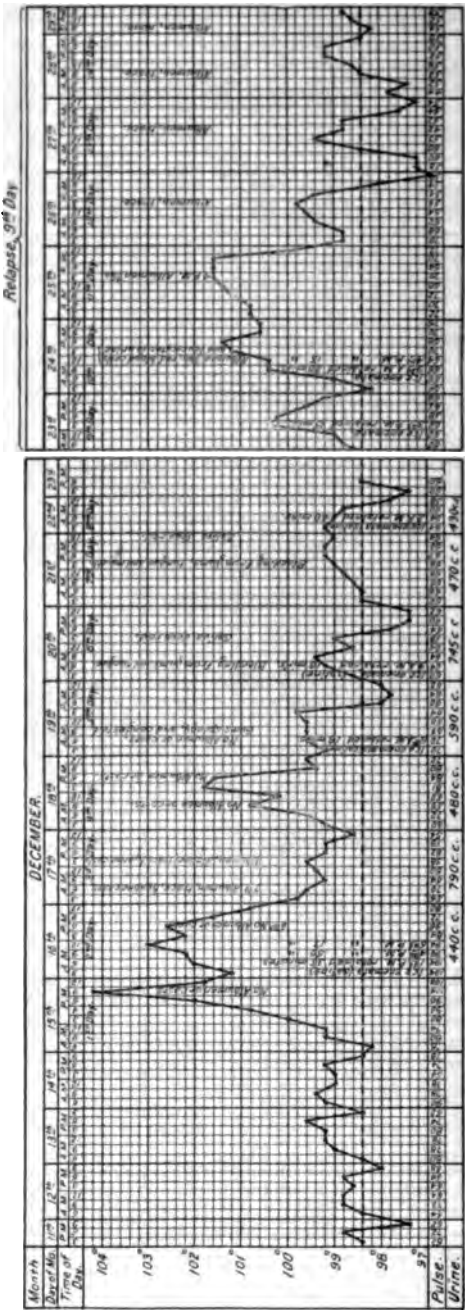


CHART N1.-- Yellow fever produced in the bite of *Culex fasciatus*.
[Period of incubation, 6 days 14 hours.]



ceeded in infecting 4, viz, 1 in tent No. 2 and 3 in tent No. 5, each of whom developed an attack of yellow fever within the period of incubation of this disease. The one negative result, therefore, was in case 2—Moran—inoculated with a mosquito on the fifteenth day after the insect had bitten a case of yellow fever on the third day. Since this mosquito failed to infect case 4, three days after it had bitten Moran, it follows that the result could not have been otherwise than negative in the latter case. We now know, as the result of our observations, that in the case of an insect kept at room temperature during the cool weather of November, fifteen or even eighteen days would, in all probability, be too short a time to render it capable of producing the disease.

As bearing upon the source of infection, we invite attention to the period of time during which the subjects had been kept under rigid quarantine prior to successful inoculation, which was as follows: Case 1, fifteen days; case 3, nine days; case 4, nineteen days; case 5, twenty-one days. We further desire to emphasize the fact that this epidemic of yellow fever, which affected 33.33 per cent of the non-immune residents of Camp Lazear, did not concern the 7 non-immunes occupying tents Nos. 1, 4, 6, and 7, but was strictly limited to those individuals who had been bitten by contaminated mosquitoes.

Nothing could point more forcibly to the source of this infection than the order of the occurrence of events at this camp. The precision with which the infection of the individual followed the bite of the mosquito left nothing to be desired in order to fulfill the requirements of a scientific experiment.

The epidemic having ceased on December 15, 1900, no other case of yellow fever occurred in this camp until we again began to expose individuals to inoculation. Thus fifteen days later we made the following observation:

Case 6.—A Spanish immigrant, aged 27, a non-immune occupant of tent No. 6, with his full consent, was bitten at 11 a. m., December 30, 1900, by four mosquitoes (*C. fasciatus*) that had been contaminated seventeen days previously by biting a mild case of yellow fever on the first day of the disease (case 4). These insects had been kept at temperature of 82° F.

The subject remained in his normal condition until the evening of January 2, 1901, the third day, when he complained of frontal headache. At 6 p. m. his temperature was 99° F.; pulse, 64. He slept well, but still complained of headache on the following morning, January 3. He partook sparingly of breakfast and afterward lay on his bed, being disinclined to exert himself. At 9 a. m. the temperature was 99° F., pulse 96; 10.30 a. m., temperature 100° F., pulse 80. A sense of chilliness and sharp frontal headache were complained of. At 3 p. m. his temperature was 100.8° F., pulse 80; his eyes were congested and face flushed. He was removed to the yellow fever wards. A specimen of urine passed at midnight, January 4, contained a distinct trace of albumin. Slight bleeding from the gums occurred on the fifth and sixth days. The patient was seen by the board of experts on the second and seventh days of his attack, and the diagnosis of yellow fever confirmed. (See Chart VII.)

The period of incubation in this case was three days, twenty-two and one-half hours. The subject had remained in strict quarantine for twenty-two days preceding his inoculation.

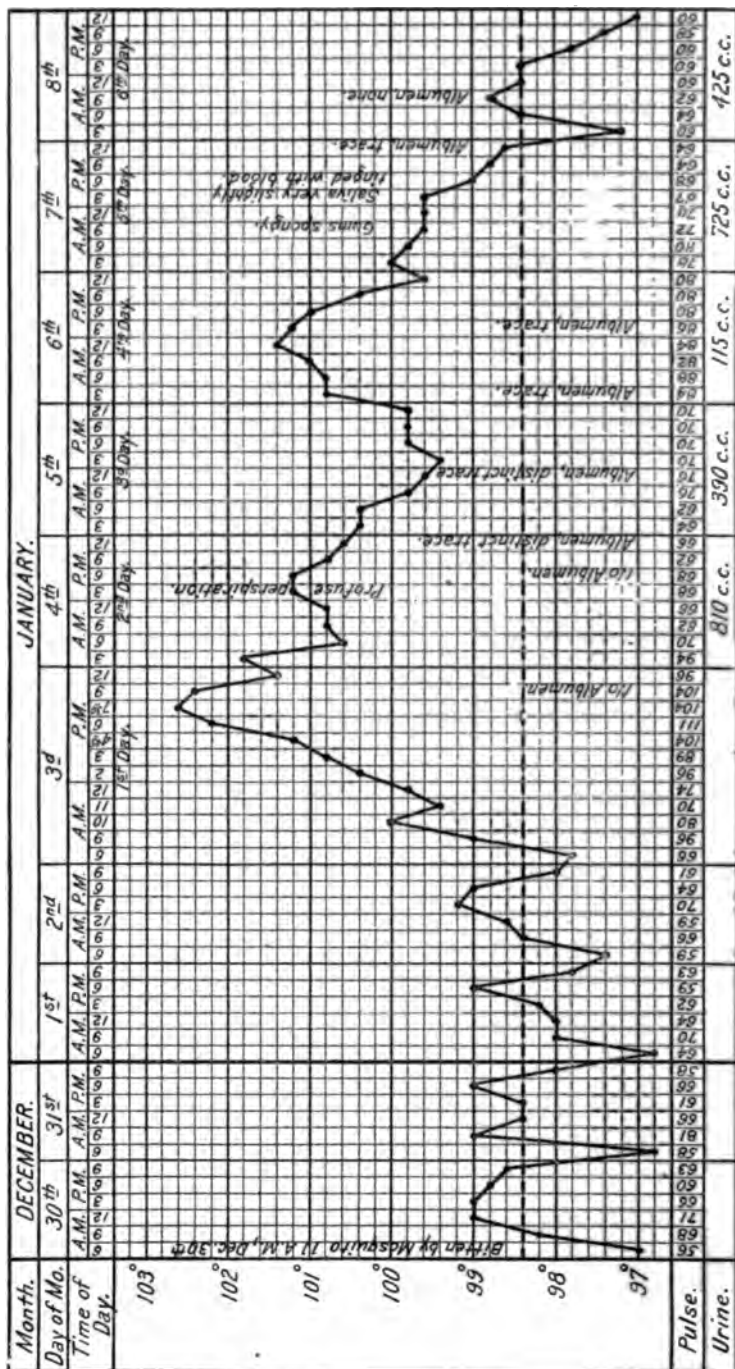
In considering the character of the attacks and the course of the disease in these five cases of experimental yellow fever, it must be borne in mind that these infected individuals were all young men, in good general physical condition and placed amid excellent hygienic surroundings. Further, it must not be forgotten that, upon the earliest manifestation of an approaching infection, they were each and all put to bed at once, and were even carried to the yellow fever wards while occupying the same bed. In other words, these men were kept at absolute rest from the first inception of the disease. Just what bearing this may have had on the subsequent course of the fever, we can not say, but since so much stress is laid on absolute rest of the patient by those having most experience in the treatment of yellow fever, the influence of this enforced rest, in our cases, upon the subsequent course of the attack, was doubtless of much importance. We reserve a consideration of the clinical side of these cases for a future report.

In our opinion the experiments above described conclusively demonstrate that an attack of yellow fever may be readily induced in the healthy subject by the bite of mosquitoes (*C. fasciatus*) which have been previously contaminated by being fed with the blood of those sick with yellow fever, provided the insects are kept for a sufficient length of time after contamination before being applied to the person to be infected.

Our observations do not confirm Finlay's statement that the bite of the mosquito may confer an abortive attack of yellow fever, when applied to the healthy subject two to six days after it has bitten a yellow fever patient. We have always failed to

CHART VII. — Yellow fever, produced by the bite of *Culex fasciatus*.

[Period of incubation, 3 days 22 hours.]



induce an attack, even of the mildest description, when we have used mosquitoes within less than twelve days from the time of contamination, although the insects were constantly kept at summer temperature. We could cite instances where we have applied mosquitoes at intervals of two, three, four, five, six, nine, and eleven days following the contamination of the insect with the blood of well-marked cases of yellow fever, early in the disease, without any effect whatever being produced by the bite. Thus in one case no result followed the bite of 14 mosquitoes which four days previously had been contaminated by biting a case of yellow fever on the first day. Again, seven days later, or eleven days after contamination, the surviving seven of these insects failed to infect an individual. On the seventeenth day after contamination, however, the bite of four of these mosquitoes—all that remained of the original fourteen—was promptly followed by an attack of yellow fever in the same individual. These insects had been kept, during the whole of this time, at an average temperature of 82° F.

Our observations would seem to indicate that after the parasite has been taken into the mosquito's stomach, a certain number of days must elapse before the insect is capable of reconveying it to man. This period doubtless represents the time required for the parasite to pass from the insect's stomach to its salivary glands, and would appear to be about twelve days in summer weather, and most probably about eighteen or more days during the cooler winter months. It follows also that our observations do not confirm Finlay's opinion that the bite of the contaminated mosquito without producing the disease may confer immunity against a subsequent attack of yellow fever. In our experience, an individual may be bitten on three or more occasions by contaminated mosquitoes without manifesting any symptoms of disturbance to health, and yet promptly sicken with yellow fever within a few days after being bitten by an insect capable of conveying the infection.

II. Having shown that yellow fever can be conveyed by the bite of an infected mosquito, it remains to inquire whether this disease can be acquired in any other manner. It has seemed to us that yellow fever, like the several types of malarial fever, might be induced by the injection of blood taken from the general circulation of a patient suffering with this disease. Accordingly we have subjected four individuals to this method of infection, with one negative and three positive results. Reserving the detailed description of these cases to a subsequent occasion, we may state that in one of the positive cases, an attack of pronounced yellow fever followed the subcutaneous injection of 2 cubic centimeters of blood taken from a vein at the bend of the elbow, on the first day of the disease, the period of incubation being three days and twenty-two hours; in the second case, 1.5 cubic centimeters of blood, taken on the first day of the disease, and injected in the same manner, brought about an attack within two days and twelve hours; while in our third case, the injection of 0.5 cubic centimeters of blood taken on the second day of the disease, produced an attack at the end of forty-one hours.

In the case mentioned as negative to the blood injection, the subsequent inoculation of this individual with mosquitoes already proved to be capable of conveying the disease, also resulted negatively. We think, therefore, that this particular individual, a Spanish immigrant, may be considered as one who probably possesses a natural immunity to yellow fever.

It is important to note that in the three cases in which the injection of the blood brought about an attack of yellow fever, careful cultures from the same blood, taken immediately after injection, failed to show the presence of Sanarelli's bacillus.¹

Our observations, therefore, show that the parasite of yellow fever is present in the general and capillary circulation, at least during the early stages of this disease, and that the latter may be produced, like malarial fever, either by means of the bite of the mosquito, or by the injection of blood taken from the general circulation.

III. Can yellow fever be propagated in any other way?

We believe that the general consensus of opinion both of the medical profession and of the laity is strongly in favor of the conveyance of yellow fever by fomites.

¹ A fourth case of yellow fever, severe in type, has been produced by the subcutaneous injection of 1 cubic centimeter of blood taken from the general circulation on the second day of the disease, the period of incubation being three days and one hour. The patient, from whom the blood was obtained, was an experimental case, which was in turn produced by the injection of blood—0.5 cubic centimeters—derived from a non-experimental case of fatal yellow fever. As "controls," cases 1, 4, 6, and 7 of this report were also injected subcutaneously with 1 cubic centimeter of the same blood without manifesting any symptoms whatever. The blood which produced this fourth case of yellow fever, when transferred at the same time to bouillon tubes in considerable quantities, gave no growth whatever.

The origin of epidemics, devastating in their course, has been frequently attributed to the unpacking of trunks and boxes that contained supposedly infected clothing; and hence the efforts of health authorities, both State and national, are being constantly directed to the thorough disinfection of all clothing and bedding shipped from ports where yellow fever prevails. To such extremes have efforts at disinfection been carried, in order to prevent the importation of this disease into the United States, that during the epidemic season all articles of personal apparel and bedding have been subjected to disinfection, sometimes both at the port of departure and at the port of arrival; and this has been done whether the articles have previously been contaminated by contact with yellow fever patients or not. The mere fact that the individual has resided, even for a day, in a city where yellow fever is present, has been sufficient cause to subject his baggage to rigid disinfection by the sanitary authorities.

To determine, therefore, whether clothing and bedding, which have been contaminated by contact with yellow fever patients and their discharges, can convey this disease is a matter of the utmost importance. Although the literature contains many references to the failure of such contaminated articles to cause the disease, we have considered it advisable to test, by actual experiment on non-immune human beings, the theory of the conveyance of yellow fever by fomites, since we know of no other way in which this question can ever be finally determined.

For this purpose, there was erected at Camp Lazear a small frame house consisting of one room 14 by 20 feet, and known as "Building No. 1," or the "infected clothing and bedding building." The cubic capacity of this house was 2,800 feet. It was tightly ceiled within with tongue and grooved boards, and was well battened on the outside. It faced to the south and was provided with two small windows, each 26 by 34 inches in size. These windows were both placed on the south side of the building, the purpose being to prevent, as much as possible, any thorough circulation of the air within the house. They were closed by permanent wire screens of 0.5 millimeter mesh. In addition, sliding glass sashes were provided within and heavy wooden shutters without; the latter intended to prevent the entrance of sunlight into the building, as it was not deemed desirable that the disinfecting qualities of sunlight, direct or diffused, should at any time be exerted on the articles of clothing contained within this room. Entrance was effected through a small vestibule, 3 by 5 feet, also placed on the southern side of the house. This vestibule was protected without by a solid door and was divided in its middle by a wire screen door, swung on spring hinges. The inner entrance was also closed by a second wire-screen door. In this way the passage of mosquitoes into this room was effectually excluded. During the day and until after sunset the house was kept securely closed, while by means of a suitable heating apparatus the temperature was raised to 92 to 95° F. Precaution was taken at the same time to maintain a sufficient humidity of the atmosphere. The average temperature of this house was thus kept at 76.2° F. for a period of sixty-three days.

November 30, 1900, the building now being ready for occupancy, three large boxes filled with sheets, pillow slips, blankets, etc., contaminated by contact with cases of yellow fever and their discharges, were received and placed therein. The majority of the articles had been taken from the beds of patients sick with yellow fever at Las Animas Hospital, Habana, or at Columbia Barracks. Many of them had been purposely soiled with a liberal quantity of black vomit, urine, and fecal matter. A dirty "comfortable" and much-soiled pair of blankets, removed from the bed of a patient sick with yellow fever in the town of Quemados, were contained in one of these boxes. The same day, at 6 p. m., Dr. R. P. Cooke, acting assistant surgeon, United States Army, and two privates of the hospital corps, all non-immune young Americans, entered this building and deliberately unpacked these boxes, which had been tightly closed and locked for a period of two weeks. They were careful at the same time to give each article a thorough handling and shaking, in order to disseminate through the air of the room the specific agent of yellow fever, if contained in these fomites. These soiled sheets, pillow-cases, and blankets were used in preparing the beds in which the members of the hospital corps slept. Various soiled articles were hung around the room and placed about the bed occupied by Dr. Cooke.

From this date until December 19, 1900, a period of twenty days, this room was occupied each night by these three non-immunes. Each morning the various soiled articles were carefully packed in the aforesaid boxes, and at night again unpacked and distributed about the room. During the day the residents of this house were permitted to occupy a tent pitched in the immediate vicinity, but were kept in strict quarantine.

December 12, a fourth box of clothing and bedding was received from Las Animas Hospital. These articles had been used on the beds of yellow-fever patients, but in addition had been purposely soiled with the bloody stools of a fatal case of this dis-

ease. As this box had been packed for a number of days, when opened and unpacked by Dr. Cooke and his assistants, on December 12, the odor was so offensive as to compel them to retreat from the house. They pluckily returned within a short time, however, and spent the night as usual.

December 19 these three non-immunes were placed in quarantine for five days and then given the liberty of the camp. All had remained in perfect health, notwithstanding their stay of twenty nights amid such unwholesome surroundings.

During the week, December 20-27, the following articles were also placed in this house, viz: Pajamas suits, 1; undershirts, 2; nightshirts, 4; pillow-slips, 4; sheets, 6; blankets, 5; pillows, 2; mattresses, 1. These articles had been removed from the persons and beds of four patients sick with yellow fever, and were very much soiled, as any change of clothing or bed-linen during their attacks had been purposely avoided, the object being to obtain articles as thoroughly contaminated as possible.

From December 21, 1900, till January 10, 1901, this building was again occupied by two non-immune young Americans, under the same conditions as the preceding occupants, except that these men slept every night in the very garments worn by yellow-fever patients throughout their entire attacks, besides making use exclusively of their much-soiled pillow-slips, sheets, and blankets. At the end of twenty-one nights of such intimate contact with these fomites, they also went into quarantine, from which they were released five days later in perfect health.

From January 11 till January 31, a period of twenty days, "Building No. 1" continued to be occupied by two other non-immune Americans, who, like those who preceded them, have slept every night in the beds formerly occupied by yellow-fever patients, and in the nightshirts used by these patients throughout the attack, without change. In addition, during the last fourteen nights of their occupancy of this house they have slept each night with their pillows covered with towels that had been thoroughly soiled with the blood drawn from both the general and capillary circulation, on the first day of the disease, in the case of a well-marked attack of yellow fever. Notwithstanding this trying ordeal, these men have continued to remain in perfect health.

The attempt which we have therefore made to infect "Building No. 1," and its seven non-immune occupants, during a period of sixty-three days, has proved an absolute failure. We think we can not do better here than to quote from the classic work of La Roche.¹ This author says: "In relation to the yellow fever, we find so many instances establishing the fact of the non-transmissibility of the disease through the agency of articles of the kind mentioned, and of merchandise generally, that we can not but discredit the accounts of a contrary character assigned in medical writings, and still more to those presented on the strength of popular report solely. For if, in a large number of well-authenticated cases, such articles have been handled and used with perfect impunity, and that, too, often under circumstances best calculated to insure the effect in question, we have every reason to conclude that a contrary result will not be obtained in other instances of a similar kind; and that, consequently, the effect said to have been produced by exposure to those articles must, unless established beyond the possibility of doubt, be referred to some other agency."

The question here naturally arises, How does a house become infected with yellow fever? This we have attempted to solve by the erection at Camp Lazear of a second house, known as "Building No. 2," or the "infected-mosquito building." This was in all respects similar to "Building No. 1," except that the door and windows were placed on opposite sides of the building so as to give through-and-through ventilation. It was divided, also, by a wire-screen partition extending from floor to ceiling, into two rooms 12 by 14 feet and 8 by 14 feet, respectively. Whereas all articles admitted to Building No. 1 had been soiled by contact with yellow-fever patients, all articles admitted to Building No. 2 were first carefully disinfected by steam before being placed therein.

On December 21, 1900, at 11.45 a. m., there were set free in the larger room of this building 15 mosquitoes (*C. fasciatus*), which had previously been contaminated by biting yellow-fever patients, as follows: One, a severe case, on the second day, November 27, 1900, twenty-four days; 3, a well-marked case, on the first day, December 9, 1900, twelve days; 4, a mild case, on the first day, December 13, 1900, eight days; 7, a well-marked case on the first day, December 16, 1900, five days; total, 15.

Only one of these insects was considered capable of conveying the infection, viz, the mosquito that had bitten a severe case twenty-four days before; while three others—the twelve-day insects—had possibly reached the dangerous stage, as they have been kept at an average temperature of 82 F.

¹ R. La Roche, Yellow Fever, vol. II, p. 516, Philadelphia.

At 12 noon of the same day, John J. Moran—already referred to as Case 2 in this report—a non-immune American, entered the room where the mosquitoes had been freed, and remained thirty minutes. During this time he was bitten about the face and hands by several insects. At 4.30 p. m., the same day, he again entered and remained twenty minutes, and was again bitten. The following day, at 4.30 p. m., he, for the third time, entered the room, and was again bitten.

Case 2.—On December 25, 1900, at 6 a. m., the fourth day, Moran complained of slight dizziness and frontal headache. At 11 a. m. he went to bed, complaining of increased headache and malaise, with a temperature of 99.6° F., pulse 88; at noon the temperature was 100.4° F., the pulse 98; at 1 p. m., 101.2° F., the pulse 96, and his eyes were much injected and face suffused. He was removed to the yellow-fever wards. He was seen on several occasions by the board of experts and the diagnosis of yellow fever confirmed. (See Chart VIII.)

The period of incubation in this case, dating from the first visit to Building No. 2, was three days and twenty-three hours. If reckoned from his last visit, it was two days and eighteen hours. There was no other possible source for his infection, as he had been strictly quarantined at Camp Lazear for a period of thirty-two days prior to his exposure in the mosquito building.

During each of Moran's visits two non-immunes remained in this same building, only protected from the mosquitoes by the wire-screen partition. From December 21, 1900, till January 8, 1901, inclusive—eighteen nights—these non-immunes have slept in this house, only protected by the wire-screen partition. These men have remained in perfect health to the present time.

December 28, after an interval of seven days, this house was again entered by a non-immune American, who remained twenty-five minutes. The subject was bitten by only one insect. The following day he again entered and remained fifteen minutes, and was again bitten by one mosquito. The result of these two visits was entirely negative. As the mortality among the insects in this room, from some unknown cause, had been surprisingly large, it is possible that the subject was bitten by insects not more than thirteen days old, in which case they would probably not infect, since they had been kept for only five days at a temperature of 82° F., and for eight days at the mean temperature of the room, 78° F.

Be this as it may, nothing can be more striking or instructive as bearing upon the cause of house infection in yellow fever than when we contrast the results obtained in our attempts to infect Buildings No. 1 and No. 2; for whereas in the former all of seven non-immunes escaped the infection, although exposed to the most intimate contact with the fomites for an average of twenty-one nights each; in the latter, an exposure, reckoned by as many minutes, was quite sufficient to give an attack of yellow fever to one out of two persons who entered the building—50 per cent.

Thus at Camp Lazear, of seven non-immunes whom we attempted to infect by means of the bites of contaminated mosquitoes, we have succeeded in conveying the disease to six, or 85.71 per cent. On the other hand, of seven non-immunes whom we tried to infect by means of fomites, under particularly favorable circumstances, we did not succeed in a single instance. Out of a total of eighteen non-immunes whom we have inoculated with contaminated mosquitoes since we began this line of investigation, eight, or 44.4 per cent, have contracted yellow fever. If we exclude those individuals bitten by mosquitoes that had been kept less than twelve days after contamination, and which were, therefore, probably incapable of conveying the disease, we have to record eight positive and two negative results—80 per cent.

CONCLUSIONS.

1. The mosquito—*C. fasciatus*—serves as the intermediate host for the parasite of yellow fever.

2. Yellow fever is transmitted to the non-immune individual by means of the bite of the mosquito that has previously fed on the blood of those sick with this disease.

3. An interval of about twelve days or more after contamination appears to be necessary before the mosquito is capable of conveying the infection.

4. The bite of the mosquito at an earlier period after contamination does not appear to confer any immunity against a subsequent attack.

5. Yellow fever can also be experimentally produced by the subcutaneous injection of blood taken from the general circulation during the first and second days of this disease.

6. An attack of yellow fever, produced by the bite of the mosquito, confers immunity against the subsequent injection of the blood of an individual suffering from the non-experimental form of this disease.

7. The period of incubation in thirteen cases of experimental yellow fever has varied from forty-one hours to five days and seventeen hours.

CHART VI.—Yellow fever, produced by the bite of *Culex fasciatus*.
[Period of incubation, 3 days 23 hours.]

8. Yellow fever is not conveyed by fomites, and hence disinfection of articles of clothing, bedding, or merchandise, supposedly contaminated by contact with those sick with this disease, is unnecessary.

9. A house may be said to be infected with yellow fever only when there are present within its walls contaminated mosquitoes capable of conveying the parasite of this disease.

10. The spread of yellow fever can be most effectually controlled by measures directed to the destruction of mosquitoes and the protection of the sick against the bites of these insects.

11. While the mode of propagation of yellow fever has now been definitely determined, the specific cause of this disease remains to be discovered.

BOARD FOR THE INVESTIGATION OF TROPICAL DISEASES IN THE PHILIPPINES.

The constitution of this board and the instructions for its guidance were published in my last annual report, page 21. During the year First Lieut. Richard P. Strong, assistant surgeon, United States Army, became president of the board on account of the relief of Lieut. Jere B. Clayton, assistant surgeon, United States Army, and his return to the United States for home service. First Lieut. W. C. Calvert, assistant surgeon, United States Army, was assigned to fill the vacancy on the board.

Much excellent work has been done by this board in the study of animal parasites, dysentery, fevers, bubonic plague, and other tropical diseases, while some valuable reports have been received from medical officers not members of the board. Under date of December 14, 1900, the chief surgeon, Division of the Philippines, reported that Lieutenant Strong, president of the board, had reached certain conclusions regarding the pathology of animal parasitic diseases and diseases peculiar to the Tropics which would be of value as diagnostic aids in caring for patients in the hospitals in the Philippines, and suggested that authority be given to publish, in the shape of circulars to the medical officers of the command, such excerpts from the reports on these subjects as might be deemed of general value. This authority was granted, and shortly afterwards Circulars on Tropical Diseases Nos. I, II, and III were published. Circular No. I, by Lieut. R. P. Strong, published in February, 1901, discusses the subject of animal parasites. Circular No. II, also by Lieutenant Strong, published in April, 1901, gives full information concerning dysentery and its causes. The substance of this circular was published in my last annual report, pages 251-273. Circular No. III, by Lieut. W. J. Calvert, assistant surgeon, United States Army, published in May, 1901, consists of an epitome of our knowledge on the subject of bubonic plague. The value of these circulars has been so highly appreciated by medical men that calls for copies of them are constantly being received.

Valuable articles have been submitted by Joseph J. Curry, acting assistant surgeon, United States Army, one of the members of the board. These, however, have already been published in the *Boston Medical and Surgical Journal*: "Pathological laboratories in the Philippines," in the issue of February 21, 1901, page 175; "Dysenteric diseases in the Philippines," in the same issue, page 177; "Bubonic plague—Report on the plague in Manila, P. I., from January 1, 1900, to June 30, 1900," in the issue of March 21, 1901, and, lastly, "The fevers of the Philippines—A preliminary report on the nature of the fevers prevalent in the Philippine Islands, including typhoid fever,

Malta fever, the malarial fevers, and undetermined tropical fevers," in the issue of May 9, 1901, page 446.

An interesting report on beri-beri, as it prevailed in the prisons at Lingayen, Pangasinan, P. I., was rendered June 4, 1901, by Acting Asst. Surg. Frank L. R. Tetamore, United States Army, which is submitted below, page 236.

BOARD FOR THE INVESTIGATION OF TROPICAL DISEASES IN THE PHILIPPINES.
CIRCULAR No. 1.

ANIMAL PARASITES.

The study of the intestinal parasites is based upon 1,793 stool examinations and upon the scrutiny of the intestinal contents from 386 necropsies.

The brief descriptions are given of the parasites as they occur in these islands, and sometimes not with the idea of adding anything new, either to their life history, anatomical structure, or pathological significance. They are recorded in this form because it is hoped they may give some idea to physicians who have lately arrived in the Philippines of the more common intestinal parasites to be encountered here. A word on treatment has been suggested, as our surgeons have sometimes found literature very scarce in the provinces.

PROTOZOA.

Two varieties of the class Sarcodina have been encountered.

I. Amœba dysenteriae.—This amœba varies from 20 to 48 μ in diameter. It possesses an endosarc and ectosarc which can readily be distinguished when the parasite is in motion. The endosarc is granular and usually incloses several vacuoles of variable size and, very frequently, red blood corpuscles. The larger forms may contain from 20 to 25 red blood cells. Pigment granules and bacteria have also been observed lying in the endosarc. On one occasion a red corpuscle which contained a tertian malarial parasite was seen inclosed in an amœba.

The parasite moves about by means of pseudopodia; blunt processes consisting of the ectosarc are first protruded, and into these protrusions the protoplasm of the endosarc appears to flow. The parasite possesses a nucleus which may often be observed in the living forms, but which can be more clearly seen in preparations stained with thionin. The nucleus is usually placed eccentrically and frequently contains a nucleolus. Sometimes in stools that have contained motile amœbæ, after a time round bodies appear which are suggestive of, and may perhaps represent, the forms described as encysted amœbæ. They have a double outline and generally inclose several round vesicles. It is still doubtful, however, whether these forms are really encysted amœbæ. We have occasionally observed what were apparently degenerating amœbæ. They appeared swollen, with an almost homogeneous central portion containing often a nucleus eccentrically placed and a few fine granules; outside this central portion and extending completely around it was a clear rim, containing sometimes several round bodies resembling fat droplets. Possibly these forms are allied to those described by Kruse and Pasquale and called dropsical and colloid degenerations of amœbæ. Rarely were they observed to have any movement.

The above amœba is apparently identical with the *Amœba dysenteriae* of Councilman and Lafleur. It has been encountered in the stools of nearly 500 cases of dysentery, and only on two occasions was it met with in the stools of individuals where no symptoms of amœbic dysentery existed at the time. One of these cases, however, had recently had dysentery. When they are present in very large numbers, the stools contain, generally, both blood and mucus, epithelial cells, and leucocytes. Portions of the stool may be at times well formed. In other instances, when they are not so abundant, the stools may be dark and fluid and contain very few red cells, but a variable number of epithelial cells and leucocytes. These amœbæ have also been found at necropsy in the lesions of the large intestine in 94 cases of dysentery. The lesions found in these cases agree with those generally accepted of amœbic dysentery. They consisted, briefly, of hemorrhagic catarrhs, always with the development of well-marked ulcerations of the large bowel. The ulcerations were circumscribed with even or ragged edges and often undermined, their bases clean, or sloughing and gangrenous. Microscopically, the parasites were found in the mucosa, submucosa, and sometimes along the intermuscular septa.

These amœbæ have also been found present in 18 liver abscesses. The abscesses answer to the description generally given of the tropical or amœbic variety. On

two occasions, where they had perforated, the amoebae were found in abscess cavities of the right lung. In 8 of the liver-abscess cases the amoebae were associated with bacteria. In 2 early liver abscesses the amoebae were present and bacteria absent.

These amoebae are pathogenic for cats, and when they are injected into the rectum of these animals, either when in the feces and in combination with bacteria, or when in the contents of liver abscesses in which no bacteria are present, they are generally capable of giving rise to dysentery and dysenteric ulcerations of the large intestine, though the results are not invariable. The ulcerations are often very striking in their resemblance to those found in the large bowel in human amoebic dysenteric cases. We have been able to produce early ulcerations in three or four days after inoculation; after one week the ulcerations may be well marked.

Our attempts to cultivate these amoebae in sterilized straw infusions have been unsuccessful. In unsterilized straw infusions straw amoebae usually developed, which made any definite observations in regard to *Amoeba dysenteriae* uncertain.

We believe this amoeba (*Amoeba dysenteriae*) to be the etiological factor in producing the lesions of amoebic dysentery and of amoebic liver abscesses, doubtless often aided by bacteria in bringing about the pictures seen in these diseases.

Too much stress can not be placed on the presence of *Amoeba dysenteriae* in the stools. In the Tropics, where the disease amoebic dysentery prevails to a very great extent, robust, strong men may be victims for a month or two without being aware that they are suffering from a serious malady. The clinical symptoms of the disease are often not in accord with the lesions of the large intestine. The intermittent periods of the dysentery, with often a few days' constipation, sometimes mislead the doctor and frequently the soldier; the latter, thinking himself cured, is anxious to return to duty. Our notes show a large number of cases that have been admitted to the hospitals, not once or twice, but some four and five times, and on each occasion with a diagnosis of diarrhea. These cases remain in the hospital from four or five days to a week or two; they then return to duty, when an exacerbation of the disease brings them to the hospital again; they gradually become weaker and weaker, until one finds them upon the necropsy table with advanced lesions of amoebic dysentery. Such histories are not very uncommon. The diagnosis can often not certainly be made without a microscopical examination of the stools, but once made, the local treatment with high quinine enemata should be begun and continued (often for several months) until the patient is cured. The treatment of the disease for a few days is useless. The early, careful, patient, and continued treatment gives at times good results, and often reverses the almost hopeless prognosis of the neglected cases. The surgical treatment of the disease is also to be considered in the cases that do not yield to treatment with enemata.

The *A. dysenteriae* is the intestinal parasite most often encountered in Manila. One hundred and fourteen of 386 deaths among our troops were due to amoebic dysentery, and this malady disables many more men here than any other disease.

II. Amoeba coli.—This amoeba generally varies from 12 to 25 μ in diameter. It likewise, as *A. dysenteriae*, contains an endosarc and ectosarc and is endowed with similar movements. The protoplasm is not so refractive. The granules are variable in size. They may be coarser, but are more often smaller and very difficult to distinguish. The vacuoles are neither so large or so frequently present. The nucleus is small and with difficulty seen in live specimens. These amoebae have never been observed to contain red-blood corpuscles. They apparently have no pathogenic action on cats. Repeated injection of the stools containing these amoebae together with the intestinal bacteria have always failed to produce dysentery or dysenteric lesions in cats. They have been encountered 8 times out of 200 examinations of the stools of different individuals where we had purposely looked for them. The patients neither had diarrhea nor dysentery, and no history of these troubles. The amoebae were found in the liquid stools after the administration of rochelle salt.

Two other cases infected with this same variety of amoeba were under our observation for three months. During this time they never had any symptoms of diarrhea or dysentery. Small, motile amoebae, never measuring more than 25 μ in diameter, could always be found in their stools after a dose of salts had rendered the movements soft and watery.

Anyone who recognizes the difference between the tertian and quartan malarial parasite, should be willing to admit that *amoeba coli* and *amoeba dysenteriae* are distinct varieties; indeed we have as much, if not more, evidence for recognizing the difference between these two than in the case of the tertian and quartan malarial parasite.

The amoebae of this second variety (*A. coli*) are apparently similar to those that Schuberg and Grassi encountered and are probably the same variety that Cunning-

ham found in cholera stools. Finally, it is not unlikely that they are the same that numerous other observers have found occasionally in epidemics of acute dysentery and where it is mentioned that amoebæ were found in only one or two of the cases studied. These amoebæ have seemed to us apparently harmless.

Great variation in the size of amoebæ found in the stools is given in the literature on this subject. Thus the amoebæ found in dysenteric stools have been estimated in size from 10 to 50 μ in diameter. We admit that amoebæ measuring from about 12 to 18 μ in diameter might be found in dysenteric stools, but we can not agree that they are *A. dysenteriae*. We have rarely observed *A. dysenteriae* with a diameter of less than 25 μ , and when we recall that this is less than four times the diameter of a red-blood corpuscle, the statement does not seem unreasonable. On the other hand, the diameter of amoebæ in non-dysenteric stools has been given from 12 to 36 μ . It is not necessary for a stool containing *A. dysenteriae* to be at the time a typical dysenteric stool. It is well known that the character of the stools in amoebic dysentery is often variable. We have never observed that the harmless amoebæ we found in the stools of our cases measured over 25 μ in diameter; they generally more often varied from 14 to 22 μ . In speaking of the diameter we have inferred, of course, the stage when the parasite is nearly circular in outline.

INFUSORIA.

Balantidium coli (Stein).—But one variety of the order of Heterotricha has been observed, viz, the *Balantidium coli* (Stein), *Paramecium coli* (Malmsten.)

This infusoria measures from 70 to 100 μ long by 60 to 70 μ broad. The periphery is covered with fine, actively motile cilia. At the anterior end is a funnel-shaped entrance, which is surrounded by cilia, and which, when the parasite is moving, gives the appearance of a revolving paddle wheel. An endosarc and ectosarc may be distinguished, and the parasite possesses the power to change its shape and may appear quite round. The endosarc contains a large, somewhat kidney-shaped nucleus and two contractile vacuoles. The surface is lightly striated longitudinally. In the posterior end is an anus, from which particles were observed at times to pass. The anterior end is more pointed than the posterior and more tapering. As many as 200 of these infusoria have been found in each drop of the feces. The parasite is capable, when present in large numbers, of causing severe chronic diarrhea. The study of sections of the intestine, from a recent fatal case, shows the parasite all through the mucosa and passing through the muscularis and submucosa; some of the sections show the parasite lying along the intermuscular septa of connective tissue in nests and penetrating for a short distance between the muscular layers. There is an extensive eosinophilia in the mucosa, muscularis mucosæ, submucosa, and lymph follicles; this process seems more marked in the submucosa. The mucosa shows areas of necrosis and of hemorrhage, with cellular infiltrations and desquamation of cells. In the submucosa there are also infiltrations of cells. These cells consist of lymphocytes, eosinophiles, and a moderate number of plasma cells. The vessels are all injected; many of them seem considerably dilated and their number increased. Many of the veins contain the parasites, and about some of these small hemorrhages and infiltrations with cells have apparently occurred. The lymph follicles are swollen. These changes occur in the large intestine and in the ileum of the small intestine.

The parasite has generally been regarded as an almost harmless one, but from the clinical symptoms and lesions found at necropsy, in our recently reported case, Johns Hopkins Hospital Bulletin, 1901, we cannot take this view of it.¹

Henschel has recommended for the treatment of the disease the employment of enemata of acetic acid, grams 50, with tannic acid, grams 5 to 2,000 cubic centimeters of water. Ortman has used quinine enemata 1 to 1,000, with good results. In our case, which was, however, one of severe infection, neither silver nitrate nor quinine enemata had any apparent influence over the course of the disease. The parasite is apparently not a very common one, as Mitter (Bietrag zur kenntniss des Balant. Coli. Kiel Inaug. Dissert.), in 1891, was able to collect only 28 cases from the literature. No mention of any pathological histology is made in this dissertation. Since

¹Since writing the above we have met with a case infected with the *Balantidium minutum* (Jacoby and Schandinn). The patient suffered from dysentery, but as the *Amoeba dysenteriae* was also present in the stools, the significance of this infusoria can not be stated in this case.

The *B. minutum* resembles the *B. coli*, but it does not measure over 40 μ long; the mouth is more prominent, and there is but one contractile vacuole. There is no apparent paddle-wheel movement of the cilia about the mouth when the parasite is in motion. There can be no doubt but that the *B. minutum* is a distinct parasite from the *B. coli*, but as in Jacoby and Schandinn's case it was associated with ankylostoma and strongyloides intestinalis infection, and in our own with *Amoeba dysenteriae*, its significance is still doubtful.

this date de la Chappelle. Finska lak sulskhardt Helsingfors, 1896, 38. 1941, 1951) has reported two other cases in man. Lönckart has found a similar, if not identical, species in the intestine of the hog. Grassi insists that this species is a distinct one.

The diagnosis may be readily made from the microscopical examination of the feces, where the infusoria are found.

MASTIGOPHORA

Flagellates.—Three flagellates have been observed. The first flagellate is pear-shaped, with a rapidly-moving flagellum situated on the rounded anterior end. It possesses an undulating membrane, which also moves very rapidly and sometimes gives the appearance of one or several flagella. The posterior extremity tapers to a point, attached to which is also often a single though less rapidly moving flagellum. Sometimes forms, apparently identical with these in every way except that they possess no flagellum on the posterior end, have been observed; but, on the other hand, forms with this posterior flagellum have been distinctly made out. The flagellate moves about very quickly, with darting like movements. It is capable of changing somewhat its outline and of pushing out short pseudopodia. It does not generally measure over 14 or 15 μ .

The second is smaller than the first described. It is sometimes a little larger, or may even be a little smaller than a red-blood corpuscle. Its shape is generally round, but at one point on its diameter is a protrusion which slightly tapers to a point. We have been able to make out but one flagellum. It revolves continually when it is in motion, and moves about over the slide in this way; but its movements are not darting or nearly so agile as in the first variety.

The third variety is somewhat pear-shaped. The rounded anterior end presents a distinct cup-shaped excavation. On the lateral margins of the excavation are two flagella, extending downward along the sides of the parasite. On the lower edge of the cup-shaped area are two more flagella also extending downward. The posterior end is somewhat drawn out to a point and also possesses a pair of flagella. Situated in the upper portion are two round bodies resembling a double nucleus, connected by a narrow band. It is usually a little larger than the first variety in size, measuring about 16 μ in its greatest diameter. Its movements in the feces are sometimes sluggish, or it may be perfectly quiet, when its structure can more easily be made out. This flagellate is apparently identical with the *Megastoma entericum* of Grassi, except that we have observed only two flagella instead of four on the posterior lip of the excavation. It is probably the same flagellate that Lambi observed in 1859 and called the "*Cercomonas intestinalis*," thinking that he had seen the same parasite that Davaine had named in 1854 "*C. hominis*." This fact probably led to the statement of Butschli and Perroncito that the *Megastoma entericum* and the *Cercomonas intestinalis* are identical.

The second flagellate that we have mentioned is probably identical with the *C. hominis* of Davaine, while the first resembles the *Trichomonas vaginalis* of Donné, with the exception that at the rounded end only one instead of four flagella have been observed.

Donné's description was made in 1837, and we think that perhaps the one flagellum, when in rapid motion, might have been mistaken for several. When the parasite becomes attached to an epithelial cell, the single flagellum of the first variety we have described can be definitely seen.¹

We shall not attempt to identify further these three protozoa with the large number and many indefinite flagellates described by other observers. Both the nomenclature and descriptions of the mastigophora found in man need careful revision.

The first of these flagellates has been encountered in 262 cases. In 137 of these it was the only parasite found present in the stools; in 78 it was associated with *ameba dysenteriae* alone, and in 10 it was found with this parasite and the second variety of the flagellates described. In 21 cases it was found with the second or third variety alone. In 3 cases it was found in connection with *Amoeba coli*. In the remaining number of cases it was associated with other intestinal parasites. Evidently it is a very wide-spread and common invader of the intestine.

The second and third flagellates have been encountered 62 times in the stools; 42 and 20, respectively. In 21 cases they occurred either singly or together and in the remaining number with other intestinal parasites.

All of these flagellates have been found in greater numbers in dysenteric and diarrheal stools. They are also found in the soft stools of individuals with appar-

¹ If, however, other observers insist that four flagella instead of one exist on the rounded end of the *Trichomonas vaginalis*, our first flagellate is not only not identical with it, but can not be placed in the family *Trichomonadidae*.

ently no intestinal disturbances, particularly in the stools of children. It is not unlikely that they may, when present in large numbers, cause some intestinal irritation, perhaps by their mechanical movements.

CESTODES.

Of the *Tenia*, only two of the adult forms have been observed. *T. saginata* and *T. solium* both exist. The former is the one most frequently seen in our soldiers; the latter occurs occasionally in the natives, who eat a great deal of uncooked pork. Only very brief descriptions of these parasites will be given, as no particular investigations have been made in regard to them, except that their occurrence has been noted.

Tenia solium.—*T. solium* (pork tapeworm) may attain a length of from 2 to 3.5 meters; the number of segments may reach 850. The first proglottides or segments are short, but their length increases from the head downward, and may eventually slightly exceed their width. About 130 centimeters below the head, the segments become mature and measure about 1 centimeter long by 7 to 8 millimeters wide. Their corners are rounded. The segments possess both male and female generative organs. The uterus consists of a median tube with not over 14 (generally from 7 to 12) lateral branches, which are widely separated. The sexual opening is near the posterior border, and may be on either side; that of the female is located just back of the male orifice and in the same sexual cloaca. The testicles appear as numerous small vesicles. The ovary is double. The vagina widens into the seminal vesicle, which passes to form the so-called "globular body." The uterus is at first a straight canal situated anteriorly. When the eggs enter the uterus from the globular body, its lateral branches grow out and become filled with eggs.

The neck is small, filiform-like and measures about 3 centimeters in length. It is surmounted by the head, which is small and spherical, and contains 4 ring-shaped suckers. Between these, the crown of the head is surmounted by a ring of short hooklets, usually numbering from 24 to 27 and arranged in a double row. The parasite attains its full growth in from three to three and one-half months. The eggs measure from .03 to .035 millimeter in diameter; they are round, brownish or yellow in color, and possess a thick shell which is covered with fine, closely-placed spicules. In the complete egg, outside the shell, is an albuminous layer which contains small nuclei and which represents the vitelline membrane. Each ovum contains an embryo, provided with 6 hooklets. When these ova are taken into the stomach, either of man or of the pig, the shell is dissolved and the 6-hooked embryo passes from the stomach, or through the bowel wall, and may work its way into the viscera, muscles, connective tissues, brain, or eye. The symptoms of infection with *T. solium* are usually gastro-enteric and nervous. The diagnosis may be made by an examination of the stools of infected individuals. The ripe proglottides are discharged singly or in chains. The ova are often also found in the feces. The arrangement of the uterine convolutions, as well as the head, serve easily to distinguish the parasite from *T. saginata*. *Tenia solium* inhabits the small intestine, where its head is often well protected beneath the valvula conniventes. Tapeworm segments should be burned. Pork that has been in cold storage for over three weeks is generally safe to eat. If the pork is thoroughly cooked there is no danger of infection.

Treatment.—The drugs most recommended are male fern, pepo, and pomegranate. Their administration should be preceded by light diet and saline cathartics and followed by purgatives. Unless the head is brought away the cure is not successful, the parasite begins to grow, and after a few months the segments begin to reappear in the feces. This parasite is often more difficult to expel than *tenia saginata*.

Cysticercus cellulosae.—No case has been observed here in man, though this condition has been encountered on a number of occasions in slaughtered pigs, and occurs not infrequently in these animals here. As has been stated above, when the ovum of *tenia solium* is taken into the stomach of man or pigs, the embryo is set free and wanders through the bowel wall. An individual infected with *tenia solium* may infect himself with the ova of this parasite by means of his fingers, and thus become the intermediate host, which is the rôle generally played by the pig.

It has been suggested that by vomiting and retching the mature segments may pass from the intestine of one affected to the stomach of the same.

The freed embryo, having reached a resting place in the viscera or tissues, undergoes various changes, and in from a few weeks to months has formed a small cyst, generally measuring from 8 to 10 millimeters in diameter. From the wall of this cyst there grows into the interior a scolex; from the latter a new tapeworm head develops and a sac forms around it. The scolices possess the head, hooks, and suckers of the *tenia solium*. About these cysts there are usually evidences of a slight inflammation. Their pathological significance depends upon their number and situation. In

the brain and eye they may give rise to serious trouble, though not always when present in these situations do they give rise to alarming symptoms. Pork infected with these cysts is said to be "measly." Man, after eating measly pork, becomes infected with *Tenia solium*. According to Professor Osler, except when the cysts are present in the eye, the diagnosis of *Cysticercus cellulosae* can rarely be made.

Tenia saginata (*T. mediocanellata* - beef tapeworm): Measures from 4 to 7 meters in length. It may possess over 1,200 segments. Its proglottides are broader and thicker than those of *T. solium*. The mature segments measure from 14 to 18 millimeters in length and from 10 to 14 millimeters broad. The segments increase gradually from the head to about the middle of the parasite, then they become longer but thinner.

As in *T. solium*, each segment represents a separate animal, and possesses all the organs except the brain. The uterus, when fully developed, lies in the middle of the segment and is straight; it possesses from 25 to 39 lateral branches, which are very closely placed and do not generally show the tree-like branching seen commonly in the *T. solium*, but its branches divide more often dichotomously. The sexual pore opens usually at the side as a small papilla, but may open, rarely, on the flat surface. The testicles are numerous and join with the single penis. The vagina extends inward behind the spermathecal chord.

The head is flat and not so delicate as in the *T. solium*; it is unarmed and possesses no rostellum or hooklets, but 4 sucking disks are present. It sometimes shows slight pigmentation. The ova are often a little larger than the eggs of the *T. solium*, but it is generally very difficult to tell the ova from one another. The eggs or segments when ingested by cattle give rise to the embryos which pass chiefly to the muscles of mastication, tongue, and heart and there form cysts similar to those which *T. solium* forms in the hog. The cysts of the former are, however, somewhat smaller than those of *Cysticercus cellulosae*, measuring about 7 millimeters in length and about 3 millimeters wide. Beef containing these cysts is said to be measly. The cysts, if left undisturbed, eventually caseate and later calcify.

The *Tenia saginata*, as *T. solium*, gives rise in man to intestinal, nutritional, and sometimes reflex symptoms. As a rule the disturbances are not marked in otherwise healthy individuals infected with either parasite. *T. saginata* also inhabits the small intestine of man. The diagnosis of infection may be made when either the segments or eggs are found in the stools, though if the eggs are alone found one can not be sure whether *T. saginata* or *T. solium* is present in the small intestine.

Cold storage usually kills the cysticercus of *T. saginata* in beef in four days.

The cysticercus of *T. saginata* appears not to occur in man.

The treatment of individuals infected with this parasite is the same as described under *T. solium*.

Tenia echinococcus. - Inhabits the upper portion of the small intestine of the dog, with the exception of the first 10 to 15 centimeters below the pylorus. It is the smallest *Tenia* of the domestic animals, and often occurs in large numbers in them. According to most observers, it usually measures not over 4 to 5 millimeters long, though Deffke gives the length at from 5.5 to 9 millimeters.

According to Leuckart, the parasite possesses only three or four segments, of which the last one is mature and exceeds all the rest of the body in size.

The hooks are from 30 to 40 in number, and have stout, root-like processes which form two rows, the inner being the larger. Behind the circle of hooks are situated four suckers. The eggs are round, and in the last segment number about 500. They have a chitinous covering. When the fourth segment is passed, its tissues decompose and the eggs are set free.

Either the eggs or proglottides, when ingested by man, or by pigs and certain other animals, are capable of causing echinococcus disease therein. On arriving in the stomach, the chitinous coat is dissolved and the embryo pushes its way through the gastric or intestinal walls. Leuckart has found them in the portal vessels.

As the liver is the organ most often affected by echinococcus cysts, and as the parasite has not been found in the lymphatics or wandering through the connective tissue, the blood vessels are perhaps their most common means of transmission to the various parts of the body. The embryos, on reaching their destination, which usually occurs in pigs about four weeks after they are fed with the proglottides of *Tenia echinococcus*, form small cysts which soon measure 1 millimeter in size. These cysts are capable of no motion. They continue to grow and after about three weeks may be as large as a walnut. The early cyst consists of a thick external, transparent covering, inclosing granular material. After a time, fluid begins to accumulate in the interior, and the exterior layer becomes slightly lamellated. A lining membrane begins to appear just inside the external layer. In this inner membrane, granules and cells and sometimes muscle fibers may be seen.

The lamellation of the external layer now becomes more marked and remains so, only it increases in thickness with age. This lamellation of the cuticular layer was always supposed to be a characteristic feature of all echinococcus cysts, but Carey and Lyon have recently shown in a primary undoubted echinococcus cyst of the pleura that this lamellation does not always occur in echinococcus cysts and hence is not absolutely characteristic of all of them. Gradually, outside of the cyst a capsule of connective tissue is formed.

While the above changes are going on, small elevations are formed on the germinal or internal layer. According to Naunyn, they are ciliated. This is the first step in the formation of the so-called "brood capsule." A cavity is gradually formed inside of them and becomes bounded by a delicate membrane; outside this layer, another cellular layer is formed. The arrangement of the layers suggests that the brood capsule may represent an invagination of the mother cyst. The brood capsules at times show active movement. The formation of the scolex begins as a thickening of the wall of the brood capsule. It gradually grows externally as a club-shaped process, still having in its interior a canal which connects with the interior of the brood capsule. At the bottom of the distal portion of the club-shaped process the hooks are formed; they first appear as bundles of prickles arranged in rows. Later the prickles disappear, except the foremost rows. The suckers are also formed here. After a longer time, muscle fibers and calcareous particles also appear. The head gradually becomes inverted into the cavity of the brood capsule, the walls covering its head become united to the hollow process, and the scolex is thus fixed to the interior of the brood capsule by a slender stalk (Leuckart).

In this way, many heads of different ages may come to lie in one capsule. In the enlarged cysts the inclosed capsules may number many thousands. The scolex resembles now a vorticella and the head has been observed at times to exhibit slight movements. The hooklets resemble somewhat those of the adult worm, only they are smaller.

The above description applies to the simple unilocular echinococcus cyst, or the so-called *echinococcus veterinorum*, which occurs more frequently in animals and is less common in man.

In the unilocular cyst, however, still another more complex process, viz. the formation of daughter cysts may occur. These consist of secondary and completely separated cysts, which may lie inside the primary cyst (endogenous type), or outside the primary cyst (exogenous type).

The endogenous type (*Echinococcus hydatidosus* Leuckart) is the one which usually occurs in man. The scolices may become vesicular and transform themselves by a similar process as in the brood capsule, or the condition may be brought about by infoldings of the parenchymatous layer. In either way, separate or daughter cysts are formed which lie within the parent cyst and correspond to them in structure. They may also give rise to scolices and hooklets. These daughter cysts may give rise by the same processes to granddaughter cysts (either endogenously or exogenously), and so on for several generations.

The exogenous type, less common in man, has been termed *Echinococcus simplex*, *E. granulosis* (Leuckart), etc. In this form the secondary cysts probably arise from the parenchymal layer. A peculiar variety of the exogenous type is the *E. multilocularis* (Virchow). It is usually found in the liver of man and may be small or occupy almost the whole lobe of the liver. Sections show a thick fibrous capsule and an internal honeycombed structure, the partitions being marked off by fibrous bands, which form by their meshes a number of small cavities. In these cavities are one or several gelatinous masses which represent degenerating hydatid vesicles. Often large cavities filled with exudation products and decomposing material are found in the liver in this form. The changes are supposed to be due to the growth of the brood capsule into the lymphatics, blood vessels, and bile ducts of the liver. These cysts may be sterile, but sometimes contain scolices and hooklets.

In man, the liver is the organ most commonly affected with hydatid cysts. The other organs, named in order of their relative frequency of infection, are the intestinal canal, bones, heart, and blood vessels. The cysts may occur in other organs and tissues.

Two cases of echinococcus cyst have been observed here in man, both at necropsy.

In the first case there existed a unilocular cyst, measuring 3 by 4 centimeters, and situated on the right lobe of the liver, and one in the omentum, measuring about 9 centimeters in diameter, with its walls adherent to the pylorus and duodenum. The cyst in the liver was degenerated; its walls were thickened and contained calcareous particles. In the interior was a yellowish, putty-like mass with a few gelatinous shreds. Microscopical examination showed cholesterol crystals, but no scolices or hooklets were found.

The cyst of the omentum contained clear yellowish fluid and a number of small gelatinous bodies (daughter cysts), measuring about 1 centimeter in diameter.

The characteristic lamellation could be observed in the cuticular layer of these cysts, and hooklets were also present.

The second case was observed during my illness, by one of my assistants, Hosp. Steward W. E. Musgrave, M. D.

This cyst was about the size of a walnut and also situated in the right lobe of the liver. Hooklets were found in this case by Contract Surg. J. J. Curry.

We have not seen the adult *tenia echinococcus*, and our description of this parasite follows, chiefly, that of Leuckart.

Treatment.—Medicines are of no value in the treatment of *echinococcus* cysts. A large number of the small cysts eventually calcify and become harmless. Operative measures are to be recommended when the cyst is large or likely to give trouble. Injection into the sac has given no good results. The cysts may be aspirated for confirmation of the diagnosis. The results of the Australian surgeons show that a large number of the cases recover after operation. During the seven years ending December 31, 1894, at the Adelaide Hospital, South Australia, 121 operations were performed on hydatid cysts, situated in the great cavities of the body. There resulted 101 recoveries and 20 deaths, a mortality of 16.5 per cent.

NEMATODES.

Ascaris lumbricoides.—The *A. lumbricoides* is the most common of the nematodes here. The female measures from 16 to 35 centimeters long; the male from 15 to 25 centimeters. The breadth usually measures 5 or 6 millimeters. Both sexes are cylindrical in shape and taper toward the ends, though the tapering is more gradual toward the cephalic extremity. In color they are yellowish-brown, reddish-brown, or pinkish. Their surfaces are glistening and striated transversely. Several bands, running longitudinally, can sometimes be made out. The parasite possesses three lips. The tail of the female is straight. That of the male is slightly curved anteriorly and possesses two small spicules. On the anterior surface of the curve a large number of papillae may be seen. The vagina of the female opens ventrally about one-third of the length of the parasite from the head. The anus opens at the tip by a transverse slit. The parasite sometimes gives off an irritating substance, which is noticeable to the sense of smell. To this substance, Peiper, of Griefswald, has attributed the nervous symptoms sometimes noticed in persons infected with the parasite.

The ova measure 0.075 millimeter long by 0.060 millimeter wide. They are usually ovoid, but may be spherical. Their color is yellowish-brown or brownish-red. Their margins are uneven and wavy. The shell is double and surrounded by an albuminous covering. The contents of the ovum have a granular appearance. The eggs are resistant to drying and freezing. Davaine has shown that the dried ova may retain their vitality for over five years. The eggs require no intermediate host, and the transmission to man is direct. Eppstein states that the round worm attains sexual maturity in from ten to twelve weeks after ingestion of the eggs. Man is primarily infected generally through drinking water, or through uncooked vegetables, salads, etc. As the transmission is direct, he is capable of reinfesting himself whenever the ova, which are found in large numbers in the feces, are carried by the fingers to the mouth, and which might happen with uncleanly persons when the fingers are soiled at stool. The parasite has caused considerable annoyance to regimental surgeons here, particularly among the volunteer regiments. Sometimes almost half of the command has been found to be infected with these worms.

The chief symptoms observed in the infected cases among our troops have been gastro-intestinal ones, the men very frequently vomiting large numbers of the worms.

The parasite has been usually found at necropsy in the upper portion of the small intestine, though sometimes in the large intestine. The diagnosis can be made by a microscopical examination of the stools in which the ova are present, or the round worms themselves may appear in the stools.

The cases usually readily yield to treatment with *santonin*.

Ocricis vermicularis.—Several cases of infection with this nematode have been observed. The female measures from 9 to 12 millimeters in length, and about 5 millimeters broad. The male is generally smaller, measuring not over 5 millimeters long. The head of both sexes is pointed. Protruding on each side from behind it, there is a swelling, lighter in color, and extending somewhat like a balloon, on each side of the esophagus for a short distance. There are three small lips. The female is easily seen with the naked eye, and looks not unlike pieces of fine thread. The body is tapering for a short distance behind the head, to its awl-shaped tail. The anus opens at the base of the tail. The vagina opens ventrally just above the anterior half of the worm. The tail of the male is blunt and often curved spirally; it possesses only one spicule.

The ova measure about 50μ long by from 24 to 29μ broad. They are somewhat elliptical in shape, but one surface is curved and the other somewhat flattened. There is a thin albuminous covering to the shell. The eggs are not killed by drying. The transmission to man is direct. Individuals may reinfect themselves with their fingers, which have become infected with the ova in scratching.

The adult parasites inhabit the lower portion of the small and the large intestine. The male usually dies after fulfilling its sexual function, and is rarely found near the rectum. The female, after becoming impregnated, passes toward the rectum. The diagnosis may be made by finding the females in the rectum, vagina, or feces. The ova have occasionally been observed in the feces of those infected. The symptoms observed have been chiefly pruritis ani, with a resulting local dermatitis. The attacks of itching come on particularly at night.

Infection probably does not occur through drinking water, as Zenker has shown that in water the ova perish quickly. Uncooked fruit and vegetables, and the hands of infected individuals are, probably often, the primary means of infection.

In the treatment of cases infected with this parasite, it is to be remembered that the sexually mature forms are to be found in the small intestine and cæcum. Doses of santonin and rhubarb by the mouth, and enemas of quassia, aloes, or turpentine, are usually successful.

Barbagallo has recently recommended senna leaves, 15 grams; water enough to make a decoction of 80 grams; then add sodium sulphate, 8 grams; simple sirup, 20 grams. Mix, to be taken in two doses, one day intervening.

Tricocephalus dispar.—The *T. dispar* is a very common parasite in Manila, judging from the number of times the ova have been found in otherwise apparently normal feces. It measures from 35 to 50 millimeters long, the female being a little larger than the male. The anterior portion is long and thread-like and contains the oesophagus. It expands rather suddenly into the posterior portion which contains the genital organs. The posterior extremity in the male is curved spirally and is surmounted by a single spicule. The vagina opens near the beginning of the posterior portion; both it and the uterus are filled with eggs. The parasite is striated transversely.

The eggs are oval in shape and their color is brownish. The shell is thick. It does not extend completely around the egg, but is deficient at the poles of the oval; here project two peg-like protrusions, which are of a lighter color than the rest of the egg and shell. The ova are possessed of great resisting powers. They may be frozen or dried without losing their vitality.

The transmission to man is direct. The embryo while still in the ovum is taken into the human stomach, where the shell is dissolved and the embryo liberated. The usual situation of the parasite is in the cæcum, or large intestine. Usually it lies loose in the bowel; sometimes the mouth appears fastened to the mucosa. Some observers have stated that the parasite is a blood-sucker and capable of causing considerable anemia. Our experience has not been that with it, but we have not encountered any cases of severe infection with this parasite as yet.

The diagnosis may be confirmed by finding the ova in the feces. The treatment is most unsatisfactory. Thymol, given in almost toxic doses, usually has no effect in expelling the parasite. Male fern and santonin are also generally useless. Fortunately there are no unfavorable symptoms in mild infections.

Trichina spiralis.—No case of trichinosis in man has been encountered by us here, but muscle trichinae have been observed on a number of occasions in Manila hogs, so that it may be safely stated that trichinosis exists here, particularly in the natives, who raise and live intimately with large numbers of pigs, and who eat considerable pork.

The muscle trichina (larval form of *T. spiralis*) measures from 0.7 to 1 millimeter in length. It is cylindrical, tapering anteriorly until the extremity is quite thin and where the mouth opens. Posteriorly, it is larger and the extremity is rounded off; the anus opens here. The oesophagus is long and is surrounded with large cells on both sides. The sexual organs occupy the ventral portions of the posterior half of the body, and the sexes can often be distinguished. The parasites lie coiled up in a sort of cyst between the muscular fibres. The cysts are oval, with generally two projections at the poles. The capsule of the cyst is chitinous, and in the older ones laminated. A single cyst may contain one or several trichinae.

In stained sections about the trichina, the muscle often stains poorly and the transverse section is indistinct or lost. In places, breaks in the muscle fiber occur. The muscle undergoes granular degeneration, while the muscle nuclei are greatly increased in numbers. Near the poles of the cysts are numerous lymphocytes and epithelioid cells. The eosinophiles are increased in number about the parasites, and often the large mono-nuclear cells show also an apparent increase.

Though we have observed no case of trichinosis in Manila, as the parasite certainly

occurs here, it may be well, from observations made elsewhere, to say a word in regard to the adult *trichina spiralis*, which may occur in the human intestine.

If a piece of meat containing the above-described cysts and embryos be eaten, the cysts are dissolved in the stomach and the parasites liberated. They quickly complete their development and copulate. The female gives birth to young trichinae in about seven days after infection. The embryos are already hatched from the shell before they pass from the uterus. They soon penetrate through the intestinal wall, and finally come to rest in the muscular or other tissues, where they gradually become encysted.

The full-grown female measures from 3 to 4 millimeters in length, and resembles a small piece of white hair; the male is considerably smaller, generally not measuring over 2 millimeters. The dorsal extremity of the latter is provided with two conical-shaped pegs, which resemble somewhat an open pair of pincers; their use, apparently, is to fix the female in copulation. The pegs are separated by several papillae. There is no spicula, but the cloaca is pushed out in copulation. The alimentary canal begins with a mouth, which appears as an intestine. It increases in caliber and passes into the general food canal. This is surrounded throughout the whole length by so-called "cell bodies," i. e., by rows of large cells, which are quite distinctive.

The stomach is represented by a flask-like dilatation and is covered by fine granular cells. It passes into the intestine which opens in a cloaca, together with the seminal duct at the posterior extremity. The testicle is represented by a pouch, situated near the posterior end. The male dies usually shortly after copulation.

In the female there is situated in the posterior extremity a pouch which represents the single ovary; it passes anteriorly into the single ovarian tube, which terminates in the vagina, about a quarter of the length of the parasite from the anterior extremity. The eggs develop within the uterus.

The diagnosis is rarely made by finding the adult trichinae in the stools. They are short-lived and perhaps are often digested and destroyed. According to other observers they disappear from the intestine in from three to eight weeks. The details of the clinical symptoms in diagnosis can not be gone into here, but the recent important work of T. R. Brown, on the blood changes, deserves special mention. This observer has shown that a marked leucocytosis occurs, in which there is an extraordinary increase in the number of eosinophilic cells. These cells may form 68 per cent of all the leucocytes. This very important symptom may suggest the diagnosis. The work of Brown has been confirmed by Professor Osler, Blume, Cabbot, Kerr, Gordiner, and others. If the diagnosis has been made shortly after infection, the bowels should be thoroughly evacuated and kept loose; calomel has been particularly recommended. Glycerin, male fern, santonin, and thymol, have all been recommended for destroying the intestinal parasites. No medicines have any influence upon the embryos after they have passed through the intestinal wall.

Filaria.—But one case of filariasis has been observed. This patient had been living in Iloilo for the past two years. Dr. Maye, an English physician who has resided in Iloilo for a number of years, tells of two cases of undoubted chyluria which occurred in natives in Iloilo, who had also never been away from that place.

Our case was infected with *Filaria nocturna*. The embryo measured about 0.35 millimeter long, by 7.5 μ wide (photomicrographs showed it to be about the diameter of a red blood corpuscle in width). The posterior end is rounded off rather abruptly, while the anterior tapers gradually to a fine point. The nematode is inclosed in a sort of sheath which, though closely applied laterally, is longer than the parasite, and a clear space can be seen above and below the true body.

Manson has described a shiny, triangular V-shaped patch, situated about one-fifth of the entire length of the organism backward, and a second similar though smaller spot, situated a short distance from the tail. He also states that the head possesses a six-lipped and very delicate prepuce. The V spots and lips are sometimes very difficult to observe in fresh specimens. The fresh embryos have a granular appearance. These embryos were not found in the blood of our patient during the day; they began to make their appearance in small numbers about 6 o'clock, and were most numerous in the blood specimens collected near midnight. The patient suffered from lymphatic swellings in the right groin and complained of pain in the right abdominal region. There was no chyluria present. He had irregular attacks of fever which lasted for a few days at a time, and in which his temperature sometimes registered 104°. An examination of his blood showed no malarial parasites; there was no leucocytosis present. A differential count showed, polymorphonuclear leucocytes, 64 per cent; small lymphocytes, 26 per cent; large and transitional forms, 7 per cent; eosinophiles, 3 per cent.

The adult parental forms of *Filaria nocturna* (i. e., *Filaria bancrofti*) measure, according to Manson, 9. millimeters in the female and 70 millimeters in the male.

They are generally found together in pairs and sometimes in groups of 6 or 7 coiled together. The males are more active and have their tails spirally twisted, as a vine.

They possess two spicules of unequal length, from which spring delicate wavy threads. The extremity of the tail in both sexes is blunt. The head is club-shaped and the mouth terminal and simple.

In the female, the uterus is double and the vulva opens a short distance behind the mouth. The alimentary canal is also simple. The embryos are born in the lymph and, passing through the thoracic duct, enter the blood. The females of certain species of mosquitoes may act as the intermediate host of this parasite. These insects, in sucking the blood of an infected subject, receive also the embryonic filariæ. The latter pass to the stomach of this host and then escape from their sheathes. They next bore their way through the stomach wall and enter the thoracic muscles. After a passive larval condition, they begin to grow with great rapidity. According to Manson, they become furnished with a mouth, an alimentary canal and a three-lobed tail. About this time the mosquito deposits her eggs and, he conjectures, probably falls into the water and dies. The filariæ then escape from the dead bodies of the mosquitoes into the water and in this medium, he supposes, they pass into the stomach of man. Here they bore through the tissues and reaching the lymphatics attain their sexual maturity.

Very recently, however, C. G. Low, in a study of filariated mosquitoes (*Culex ciliaris*), has found the filariæ passing into the proboscis of the mosquito. He states that the parasite does not pass along the salivary duct, but makes an independent passage through the base of the labium and the hypopharynx. He thinks that it seems fair, therefore, to conclude that when the mosquito bites, the filaria finds its way into the human body along the proboscis.

Still more recently, however, Grassi and G. Noe have insisted that the filariæ are not free, as shown in Low's drawings, but are still inclosed in the prolongation of the general body-cavity within the labium. These authors further claim that the embryo does not pass to man in the way that Low has described, but by a different mechanism, viz: that in biting, the labium of the anopheles is bent, and, being stuffed with filariæ, the integuments of the labium are ruptured along the dorsal groove and through the rupture thus produced the filariæ come out to penetrate the body of their host. By a large number of experiments, they have shown that *Anopheles claviger* may become infected with filaria after biting a dog which is already infected with this parasite. Other healthy dogs become infected when bitten by these anopheles in turn, the filariæ passing from the mosquito into the circulation of the dog, as stated above. This, then, seems to be the probable mode of infection in man.

In regard to the treatment of the disease, no drug, so far as known, will destroy the embryos in the circulating blood. Austin Flint has, however, reported a case of chyluria cured with methylene-blue, 2 grams every four hours for five days. The surgical treatment, particularly the removal of the adult parasites from the enlarged lymph glands of the groin, is sometimes, though not always, successful in producing a cure.

The prevention of filarial disease consists in using drinking water not contaminated by mosquitoes, and in sleeping under mosquito nets. It is to be remembered that patients suffering from filariasis, particularly in hospitals, are to be regarded in the same light as those suffering from malaria, viz, as dangers to the community. Such cases should be isolated and kept under mosquito nets when mosquitoes are about.

Filaria cervina is not uncommon here in the abdominal cavities of cattle, and intra-ocular filaria (probably *papillosa*) occurs in the horse.

The Ankylostoma duodenale.—This nematode often gives rise to grave disturbances, and is not infrequently encountered here.

The male measures from 6 to 10 millimeters in length and from about 0.5 to 1 millimeter in breadth; the female is from 6 to 18 millimeters in length and is occasionally a little thicker than the male. They are grayish-yellow or grayish-red in color, or when filled with blood, they may be much swollen and dark-red in appearance. Generally, with the naked eye, about one-third the length of the body from the head, the beginning of the intestine may be distinguished by its darker color; particularly when the parasite contains much blood is this well marked off.

Microscopically, the cephalic extremity is generally bent dorsally. The mouth opens on the ventral side and contains six hook-like teeth, four in-curving and placed ventrally and two conical and placed dorsally. The œsophagus is cylindrical and somewhat vase-shaped, with a longitudinal cleft; its inferior extremity is rounded. Following the œsophagus comes the intestine. Two longitudinal bands of muscle extend downward on each side of the intestine. The surface is striated longitudinally. The parasites usually contain blood pigment and red-blood cells.

The female, which is three or four times as frequent as the male, may be distin-

guished from the latter by its caudal extremity, which is tapering and somewhat awl-shaped. The vulva lies behind the center of the body. It, also, is larger and contains more blood than the male. The caudal extremity of the male is dilated and forms the bursa copulatrix, which consists of a threefold fan-like apparatus from which issue two very fine, thread-like spicules, which represent the penis.

The adult parasites are not generally found in the stools, unless the patient has undergone treatment with an anthelmintic. The ova, however, are found in the feces of those infected and give evidence by their numbers of the severity of the infection. The eggs are oval and measure about 45 to 68 μ long and from 25 to 38 μ broad. When seen in the feces, they are already partially segmented into two, four, or eight cells; sometimes, but rarely, they show here further segmentation. The shell is transparent and there is a clear rim between the segmenting yolk and the shell. After three or four days under favorable circumstances the larvae are hatched, and they then have the typical rhabditis form and resemble the embryos of the *Anguillula intestinalis*; though they are somewhat smaller than, and the oesophagus is relatively somewhat longer. The ankylostoma embryos are never found in the freshly passed feces, however.

We have not been able to confirm the recent work of Giles, that the parasite represents an example of dimorphism or heterogenesis. The embryonic forms we were able to obtain soon died without further development. Cases of combined infection with the *Anguillula intestinalis* and the *Ankylostoma duodenale* are not uncommon, and it is possible that the adult, free-living generation of *Anguillula intestinalis*, or other free nematodes occurring in the culture media used might be mistaken for and as representing the parent stage of the free-living generation of *Ankylostoma duodenale*. However, it is only fair to state that Giles has apparently excluded these contaminations. His material seems to have been very abundant and his experiments carefully performed. Few have probably given this work the attention that he has done. At the same time, granting that the parasite has an adult free stage, it is probable that the transmission to man may often be direct.

The ova of the ankylostoma have been recorded present in the stools of 46 cases (on five occasions associated with other parasites). In the majority of these cases, the adult parasites have been found in the dejections after treatment with thymol. In addition, the adults and ova have been found in the intestine in eight cases at necropsy.

The patients with very mild infections may present no noticeable symptoms. With severe infections there has always been considerable anemia. In one case of severe ankylostomiasis and concurrent typhoid infection, which later came to necropsy, the red-blood cells counted only 2,800,000, the hemoglobin registered 40 per cent, and the white cells numbered 8,000.

The anemia resembles clinically and in its blood-changes the usual changes seen in advanced, secondary, or chronic anemias, with the exceptions that the leucocytes are sometimes relatively increased, the eosinophiles generally more numerous, and the percentage of hemoglobin generally relatively lower. The parasite extracts the fresh blood through the mucosa, and the anemia is generally in proportion to the number of parasites present in the intestine. It has been suggested, but not conclusively demonstrated, that the parasite excretes from its skin a toxic substance. Gastro-intestinal symptoms have been frequent. Diarrhea has not been an uncommon symptom; it may be intermittent. The temperature is often subnormal, though there may be slight fever at times.

Sections from the liver, in addition to the very advanced fatty degeneration of the cells, show grains of yellow pigment situated inside the liver cells, which give the chemical reactions of haematoidin. Daniels first noticed the occurrence of these granules and thought that they might represent the result of blood destruction within the vessels, due to some toxic substance produced by the parasite and absorbed from the intestine. To this he attributed the anemia of ankylostomiasis. Rake, however, in 1894 concluded from a chemical estimate of the amount of iron found in the liver in five cases of ankylostomiasis that in this disease the iron contained in the liver is below the normal average, and that the anemia is due to the direct abstraction of blood by the parasite. However, this yellow pigment may be often very abundant in the sections of the liver in cases of ankylostomiasis.

In none of our eight fatal cases infected with this parasite can the ankylostoma be said to be the sole cause of death, for at necropsy there have always been other lesions present. In two cases of severe ankylostomiasis the lesions of typhoid fever also existed. In neither of these would we have expected a fatal issue from the typhoid infection alone. In one, the temperature had almost reached normal. In both, at necropsy, there was advanced anemia and fatty degeneration of the liver; in one the heart and kidneys were also fatty, and in the other marked cloudy swelling of these organs existed.

In the eight cases the liver showed fatty degeneration in six, the heart in two, and the kidneys in four. Cloudy swelling was present in the liver in two cases, in the heart in four, and in the kidneys in one.

The diseases the cases of ankylostomiasis were associated with were: Acute lobar pneumonia, 1; amœbic dysentery, 2; chronic parenchymatous nephritis, 1; amœbic abscess of the liver, no lesions of dysentery in the large intestine, 1; cancrum oris, restivo-autumnal malarial fever, intestinal infection with *Strongyloides intestinalis*, 1; typhoid fever, 2. The infections with ankylostoma were severe and the ankylostoma were very numerous in five and moderate in three.

The parasites were found in the lower part of the duodenum, in the jejunum, and upper portion of the ileum. In all the cases there was intestinal catarrh, proportional to the number of nematodes found therein. In addition to the pallor and small amount of blood in all the organs and tissues, in the severe infections, effusions into the pericardium and abdominal cavity sometimes occurred.

An extract from one of our necropsy records, of a case of severe infection, reads as follows:

Small intestine: Beginning a short distance below the pylorus, the mucosa of the duodenum and of the jejunum is bathed in a considerable layer of mucus. In the lower half of the duodenum and upper two-thirds of the jejunum the mucus is much more abundant, reddish, and mixed with considerable blood. This bloody, mucous exudate is not only covering the mucosa, but considerable of it is lying free in the lumen of the bowel. On removing most of the exudate, the mucous membrane appears often uneven and occasionally distinct islands of more swollen mucosa, surrounded by depressed areas of a grayish color, may be seen. Many ecchymoses are present in and just beneath the mucosa and a few small pigmented patches also exist. Hanging to the wall of the duodenum and upper two-thirds of the jejunum are seen very large numbers (thousands) of the adult *Ankylostoma duodenale*. They are also present, but in much smaller numbers, in the lower end of the jejunum and upper portion of the ileum. Their heads are often buried in the mucosa. Many of them are fastened firmly to the intestinal wall and are not easily washed or brushed away. The bodies of a large number of the parasites are of a bright-red color and filled with blood. In some places the walls of the intestine are distinctly thickened, the mucosa being particularly affected. These regions of thickening correspond generally to those where the intestine contains the most bloody mucus, and to where the ankylostoma are apparently in greatest number. The large intestine, with the exception of the advanced pallor, appears normal.

The sections of the small intestine show the surface of the mucosa bathed in mucus and sometimes swollen. There are many torn villi, or here and there a villus and crypt of Lieberkühn have been destroyed. There is an extensive infiltration of the mucosa, muscularis, and upper portion of the submucosa. The infiltration consists of small round cells, eosinophiles, plasma cells, blood cells, and a variable, though smaller, number of polymorphonuclear leucocytes. With a low power, small red spots may be seen lying in the walls of the crypts of Lieberkühn. Upon examination with higher powers, these are seen to be clumps of eosinophiles, lying three or four together. A number of them show increased diameter and contain swollen, large, red granules, which appear somewhat vesicular. The eosinophiles show a marked increase in the mucosa; they are also increased in number, but less numerous in the upper portion of the submucosa. The ova of the ankylostoma are not seen in the tissues and there are no cysts containing the eggs, as seen in the sections of the intestine from cases of infection with the *Strongyloides intestinalis*. Only rarely is an ovum seen, then it is lying free on the surface of the mucosa. The segments of the egg stain a deep purple with hæmatoxylin, while the protoplasm about it and the shell remain perfectly clear and take no stain.

Portions of the adult ankylostoma may be seen cut transversely, lying near the mucosa, or with their heads buried in it. There are frequent small hemorrhages about them. Though in the sections studied no parasites have been found with their heads lying in the submucosa, there are evidences present that the parasite does travel this far, for there are breaks in the muscularis mucosæ and in some of these breaks a portion of the villus has been pushed into the upper portion of the submucosa. There are well-marked infiltrations of cells and small hemorrhages in these regions.

Many of the epithelial cells of the mucosa stain poorly and show cloudy swelling. A large number are swollen and contain large drops of mucin; there are also a number of droplets outside of the cells and lying within the crypts of Lieberkühn. Other cells show evidences of proliferation by the karyokinetic figures seen in their nuclei.

The diagnosis of ankylostomiasis may be made when the ova are found in the feces.

In the treatment of the disease, thymol is the drug to be most recommended for ridding the patients of the parasite. There is some danger attending its use in the large doses sometimes required. General tonic treatment is often necessary during convalescence.

Cats here are not infrequently infected with the *Uncinaria trigonocephala*.

Strongyloides intestinalis.—This parasite was observed for the first time in North America by the author, in Baltimore, in December, 1897. A review of the literature and a report of the clinical symptoms and pathology of this case and other cases infected with the *Strongyloides intestinalis* was published in the Johns Hopkins Bulletin for 1901. More recent studies have shown that the parasite is not an uncommon one in Manila, we having met with 13 cases of infection with it.

The diagnosis of infection with this parasite may be made by finding the rhabditis forms in the stools. Here they measure from 0.25 to 0.60 millimeter long by 16 to 22 μ wide. In fresh stools they are very active, swimming both forward and backward with eel-like motions, quickly coiling themselves up or again straightening themselves out. They are often found intimately mixed with fecal matter, which sometimes seems to closely adhere to them. They resemble the ankylostoma larva with the exception that they have at first a larger body.

Many of these larvae, when placed in the stools in the incubator, after twenty-four hours begin to molt and to slip out of their skins; often the forms may be observed half out, and some just slipping out and casting off this outer covering. Their structure can now be more clearly made out. The cephalic extremity is rounded and pierced by the buccal orifice, where may be seen the suggestion of the lips. Following the mouth comes a vestibule, which in the embryo for a short distance undergoes a slight gradual enlargement, and then becomes slightly contracted. This is followed by a swelling or bulbous portion of the esophagus, which is again narrower. This latter portion of the esophagus is followed in turn by a second bulbous portion or stomach, which incloses an apparatus for trituration, composed of three chitinous teeth, placed in this form: (v). The stomach is followed by the intestine, which ends in a test situated at the right side of the animal just above the base of the tail; at times it protrudes slightly and particles are seen to pass from it. Situated on the right side, about one-third of the distance from the bulbous portion to the tip of the tail, may be seen a whitish, somewhat oval-shaped area, which represents the sexual rudiment. The tail is tapering and pointed. On each side of the body in the older forms may be seen, beginning at the bulb of the esophagus, two longitudinal series of muscular plates placed very closely together. They can only be separated from one another by their nuclei. These embryos are found at necropsy throughout the intestinal tract.

Either one of three things happens to these rhabditis larvae. They may die after three or four days, they may be transformed into filariform larvae, or they may develop into the males or females of the adult free form.

Change to the filariform larvae: The forms which begin to change to this generation have soon much longer and tapering tails, often rolled in a spiral manner. The parasite looks, therefore, thinner. They soon begin to resemble young filaria, to lose the rhabditis form, and to pass to the strongyloid form. The esophagus loses its chitinous tooth as well as its swelling and first segment and becomes a cylinder which traverses the whole anterior half of the worm and then continues with the intestine. Their edges become slightly wavy. These forms grow no larger, but gradually their tails begin to shorten. If left in the stools, by the end of a week they all die; but if taken into the stomach of man in drinking water or on uncooked vegetables, salads, etc., they grow to the adult parasitic form of the *Strongyloides intestinalis*, which will now be considered.

The adult strongyloid form has the aspect somewhat of a filaria or of a strongyle. It represents the strongyloid form of the dimorphous species of this parasite. The adults are not found in the feces, except after purges or anthelmintics, or when dead, but inhabit the duodenum or jejunum of man. They measure 2.10 or 2.20 millimeters long by 32 to 39 μ wide. The body increases slightly and gradually in size from the head to about the posterior fourth of the body. It terminates behind rather suddenly in a short tail; the tip of the tail is rounded and even a little dilated. The surface presents a fine regular striation. The mouth is simple and possesses no armature. Following the mouth comes the esophagus, which is nearly cylindrical, and which occupies nearly a quarter of the length of the parasite and presents no enlargements or swellings. Next to the esophagus comes the intestine, which could easily be confounded with it but for the change in its color. The intestine terminates itself at the base of the tail by an anus, which has the appearance of a transverse slit. The vulva opens at the posterior third of the body on the side; there is a slight protrusion and a transverse opening; the uterus also opens here in the adult. It incloses five or six eggs of a yellowish, granular appearance, ellipsoid, and measuring 59 by

34 μ . The eggs are often seen segmenting. These forms are apparently all females, yet it is still a question whether they are parthogenetic or whether they are true hermaphrodites.

The free eggs are also often seen in the human intestine. They are oval and resemble those of the ankylostoma, only they are a little larger, measuring from 60 to 70 μ by 37 to 39 μ . They are often joined together in strings of two or three. All stages of segmentation may be observed in the intestine, and the embryos may frequently be seen just issuing from their shells.

If the embryos found in the stools do not become filariform and change to the strongyloid form, they may, as has been stated, become, after forty-eight to seventy-two hours in the incubator, adult males or females of the free living generation. In this generation, when both males and females are present, there are from eight to ten times as many females as males present. The females are the larger and their bodies also taper more in the posterior portion. They measure, generally, from 1 to 1.4 millimeters in length, and from 0.05 to 0.075 millimeter in breadth. In the adult free living generation the œsophagus has the same form as that of the larva, only it has not lengthened itself so much comparatively, measuring now about 0.16 millimeter. Of the three portions of the œsophagus the buccal is the longest; it measures 99 μ and represents in consequence a little more than one-half of the entire apparatus. The cephalic extremity is rounded and pierced by the mouth, about which one may see on careful examination three or four lips. Following the mouth comes a vestibule, which, for a short length presents a gradual enlargement. It enters the anterior extremity of the œsophagus which juts from its interior under the form of a smooth cone. The vestibule is much better developed than in the larvæ. Following this portion of the œsophagus comes the bulbous or terminal portion, inclosing an apparatus for dentition, consisting of three chitinous teeth in the form of a ∇ . The intestine of the female is also somewhat longer than that of the male; it ends, as in the larvæ, in a teat at the right side of the body at the base of the tail, and is often a little protruded. On each side of the body, running longitudinally, can sometimes be counted from 16 to 18 cells, which are closely placed, but which can be distinguished from one another by their nuclei. In the female the posterior extremity of the body stretches itself out into a thin, fine tail, often lightly coiled in a spiral. A little below the middle of the body, on the right side, the vulva opens, marked by a slight contraction and giving access to a double uterus, of which the horns extend, one anteriorly and one posteriorly; each of these is terminated by an ovary.

The eggs measure from 45 to 70 μ . They are elliptical, the shell is delicate and the vitellus contains few granules. The eggs are often segmented when laid, indeed they hatch not infrequently in the body of the mother.

The adult free males differ in the following respects from the females. They are shorter and thinner, measuring from about 0.75 to 1 millimeter long by 0.04 to 0.06 millimeter wide. The œsophagus is also a little shorter than that of the female. The caudal extremity measures about 70 μ ; it tapers quickly and is curved on itself in a manner quite different from the spiral coils of the tail of the female. Just at the base of the tail one may see clearly two spicules, cone shaped and curved, which represent the penis. In front of the cloaca on the ventral side are two or three small papillæ. The adult forms copulate, and from the eggs of the female the embryos hatch usually within twenty-four hours. The resulting embryos are thin and their tails tapering. They show at first the bulbous swelling of the œsophagus and the chitinous teeth. They soon lose these structures, however, and become more like filaria; that is, they change from the rhabditis to the strongyloid form. If they are now taken into the stomach of man they may grow to form the adult female parasitic strongyloid form; otherwise they soon die. Thus it may be seen that the first and second generation may be quite different morphologically from one another. For this reason they were supposed for a long time to represent two distinct parasites and were described under the names of *Anguillula stercoralis* and *A. intestinalis*. It seems that only the latter is parasitic, and that the former perhaps merely serves to perpetuate the species more effectively.

Microscopical study of sections of the small intestine, cut from the duodenum and upper portion of the jejunum, show in general a catarrhal inflammation with desquamation, and in many places atrophy of the epithelial cells. The solitary follicles are often slightly swollen, and there are often infiltrations of small round cells about the glands. There is usually a moderate increase in the eosinophiles in the tissues which contain the parasites and ova. In sections stained with Unna's alkaline blue, only a few plasma cells may be seen.

The sections show in addition, first, many eggs in various stages of segmentation, some containing embryos, generally lying in the bottom of the crypts of Lieberkühn. In these crypts the epithelium is much compressed and often atrophied. The nuclei

lie at the base of the cell, and about them usually no cell substance can be made out. Some crypts contain as many as two eggs. The epithelial cells then seem considerably compressed and atrophied. About these crypts which contain eggs (particularly when they are segmenting or contain embryos not yet hatched) there are a few round cells. The diameter of the crypts containing eggs or parasites is always considerably larger than the surrounding crypts without parasites. In sections where the egg has burst and the embryo escaped, the epithelium of one side of the crypt has disappeared. About these crypts there are some evidences of proliferation, as evidenced by the karyokinetic figures of the nuclei of the surrounding cells, and the same compression and atrophy of the epithelial cells, with infiltration of round cells about them, exist. In other crypts, the egg rests on the basement membrane of the gland. The epithelium is then either gone entirely or is also much compressed. Not infrequently what appear as small cysts (in transverse sections) are seen lying in the walls of the crypts, resting on the basement membrane. Apparently the eggs have disappeared from these cysts, leaving clear areas. There is no evident infiltration with small round cells about them. Secondly, pieces of the adult female cut longitudinally and transversely, lying in the lumen of the crypt or down beneath the epithelium of the crypt or villus and resting on the connective tissue, which lies between the muscularis mucosa and the blind end of the glands. There are usually infiltrations of small round cells about the parasites, and karyokinetic figures may also sometimes be seen about them, together with round, oval, and spindle-shaped cells. In sections which contain the adult in or near the mucosa, the desquamation of the cells may be marked and many of the neighboring nuclei stain poorly. Thirdly, many of the crypts contain embryos. These crypts show the same flattening and atrophy of the epithelial cells. In some places the cells are entirely absent from the crypt, and at first sight it may appear that the embryos are in the lymph spaces. The sections show sometimes the embryos breaking through the crypts or lying between the epithelium of the villus. There are usually desquamating cells lying about them.

In 1895 and 1896, B. Tessier stated that he believed the *Anguillula stercoraria* gave birth to small embryos which penetrated through the intestinal wall through the breaks in the mucosa and appeared in the circulating blood. He was led to take this view because in a patient which he observed he found the embryos of the *Strongyloides intestinalis* in the stools, and filarial-like embryos in the circulating blood. He concluded that the parasite was hence a facultative hematozoon. In careful and repeated examinations of the blood, in our cases of infection with the *Strongyloides intestinalis*, we have never found the embryos in the circulating blood. It is not clear that Tessier's case was not one of combined infection with a variety of filaria and the *Strongyloides intestinalis* and we are inclined to take this view of it.

Our patients all showed diarrhea, which was sometimes moderate and generally intermittent in character; they also in addition often suffered from gastro-intestinal disturbances. There was usually moderate anemia present. The leucocytes were generally normal or slightly increased in number. Differential counts showed about normal proportions of the leucocytes; the eosinophiles did not number over 2 or 3 per cent.

We have never yet found this parasite in a well individual.

From the clinical study, and particularly from the histological study, of sections of the small intestines from cases infected with this nematode, we can not conclude that the parasite is harmless, while on the other hand it is not a particularly dangerous one to man. We believe it to be capable of causing clinically an intermittent diarrhea with intestinal disturbances, and anatomically a catarrh of the small intestine. It seems quite certain that the parasite, from the positions it occupies in the mucosa and from the changes about the ova, embryos and adults lying in the tissues, may cause particular changes by its rapid mechanical movements. Moderately severe infections probably cause only slight disturbances.

As has been stated, the diagnosis rests upon the presence of the rhabditis embryos in the stools. The eggs and adult females, except after treatment, are generally not found there. In ankylostomiasis, the ova are always present in the stools, and thus the two affections may be easily differentiated.

Treatment.—The milder cases of infection sometimes yield to large doses of thymol, together with purgatives and general tonic treatment. It is often necessary to repeat the treatment at intervals. In very severe infections, neither male fern nor thymol is of any apparent value in ridding the patient of the parasite.

The parasite has also been found here in the small intestine of monkeys, producing apparently the same changes as seen in man.

In perfectly healthy monkeys not previously infected with this parasite, however, we have recently been able to produce successful inoculations by introducing stools containing the embryos of the *Strongyloides intestinalis* into their stomachs.

The monkeys were fed through a stomach tube with a portion of a stool containing the embryos. The diarrhea was generally noticeable after about a week follow-

ing the inoculation. The only difference of moment noted between the diarrhea in the monkey and in man is in the fact that in the latter the ova are usually found in large numbers in the feces. These experiments have settled definitely that the parasite is both capable of producing diarrhea and of bringing about pathological changes in the small intestine.

DIPTERA.

Seven cases of myositis interna have been observed. The dipterous larvæ have been passed in these cases in the perfectly fresh feces. The larvæ observed have been those of the *Calliphora vomitoria* (blue-bottle fly), and more rarely of *Anthomyia canicularis* (flower fly).

The latter was found in one case in the feces of a newspaper reporter who had accompanied our troops on a long march. He had not been particular about his diet, having at times eaten native food.

The symptoms observed in these cases were moderate diarrhea and occasionally gastric or intestinal pains.

The diptera in the feces may be easily seen with the naked eye. They measure from 2 to 2½ centimeters in length. Their diameter increases from the anterior or head end downward, so that at the posterior end they are quite broad. Their cylindrical bodies are ringed with generally about ten ribs.

They are apparently easily expelled with ordinary purgatives.

The cases of infection with *Calliphora vomitoria* probably occur from eating meat upon which the ova of these flies have been deposited.

The cases of *Anthomyia canicularis* infection probably occur from the vegetable material of food infected with their ova.

HIRUDINES.

Our soldiers on the march, particularly along the bases of the mountains in the wooded districts, have been troubled considerably at times with leeches.

These parasites measure, before being filled with blood, about 2 centimeters in length and about 4 or 5 millimeters in thickness. They apparently cling to the branches of the trees or lie in the grass, and fasten themselves on the individuals as they pass. The ankles have been their most common place of attack; the parasite apparently working in at the shoe-laces. In several cases they have entered the eye and fastened themselves beneath the lid, causing considerable pain and anxiety.

TREMATODES.

Paragonimus westermani.—Opportunity is here taken to call attention to the fact that this parasite, which has been found in China and Japan and more recently in America, has lately been intimated by American writers to also occur in the Philippines. Although we have sought for it in this laboratory, we have not observed it here, and, so far as I know, the parasite has not been found in these islands. A word on its description may, however, not be out of place. The following account is mainly from that given by Stiles and Hassall in their recent article on this subject:

"The parasite has been found in the tiger, dog, hog, cat, and man, and seems to be identical in these animals. Its life history is still obscure. The fluke measures 16 millimeters long, 4 to 8 millimeters broad, and 2 to 5 millimeters thick. It is found encysted in the lungs. The eggs do not apparently develop until they leave their host by means of the sputum. Among the symptoms produced by this parasite, cough and spitting of blood are common. The sputum may resemble that of pneumonia between the attacks of hæmoptysis. Probably the disease is sometimes confounded with tuberculosis. The correct diagnosis may be made, however, by finding the ova in the sputum. The eggs are oval, with even borders, and possess a double outline. They measure from 80 to 100µ in length and from 40 to 60µ in breadth.

"Though the parasite is usually found in the lungs, it may at times locate itself in the brain, when attacks of epilepsy of the Jacksonian type may result. In other instances the liver and other organs may be invaded."

BOARD FOR THE INVESTIGATION OF TROPICAL DISEASES IN THE PHILIPPINES.—CIRCULAR No. 3.

BUBONIC PLAGUE.

Plague is an acute, infectious disease, running a rapid, severe course, and usually terminating fatally. It generally is characterized by buboes, high fever, severe general symptoms, and is frequently accompanied by subcutaneous hemorrhages, pustules, and carbuncles.

History.—From earliest times, writers have described epidemics of plague. Their descriptions are, however, too vague to permit of a diagnosis of the disease now known as bubonic plague, since the word "plague" was used to designate any highly fatal epidemic.

Egypt seems to have been the starting point for many of these ancient epidemics, which are first accurately described by Rufus of Ephesus, in the first century A. D. From his writings it is ascertained that the first carefully described epidemic occurred about the end of the third and the beginning of the second century B. C. This epidemic extended throughout Libya, Egypt, and Syria. From this time until the Justinian age numerous indefinite descriptions of bubonic plague have been given.

About 542 A. D. a second accurately described epidemic started in lower Egypt, especially in Pelusium, gradually extending thence along the north coast of Egypt to Palestine, Syria, and finally to Europe. The disease was present throughout Europe during the following half century. From this period to the fourteenth century A. D., Europe was visited by numerous epidemics, but again the descriptions are too vague for identification with plague.

A second severe epidemic raged throughout Europe during the fourteenth century, with an estimated death-roll of 25,000,000 of people. The disease was, moreover, continually here during the following three centuries, its severity gradually diminishing and the epidemics becoming more widely separated. The last occurred in Constantinople in 1841, but as late as 1878 a small endemic is recorded in the Russian-governed province of Astrakhan. Lower Egypt was the epidemic home for bubonic plague in Africa, as was Turkey in Europe, and Syria in Asia.

Epidemic centers of plague have extended into western Asia, whence it has spread to practically all of the Oriental ports, Oporto, and South America.

The history of plague shows that as civilization improved social and hygienic conditions, plague sought its more congenial surroundings amid the filth of the ignorant.

Etiology.—Plague is produced by the bacillus *Pestis bubonica*, first discovered by Kitasato. This bacillus is a short, round-end, encapsulated organism. As seen in smears from the blood and glands, it appears singly, in pairs end to end, and in chains of three or four. It varies in length from 1 to 1.8 μ , and in width from 0.4 to 0.7 μ . The size and contour of the bacilli vary greatly, these being determined to some extent by the culture media upon which they grow. Organisms found in the blood are frequently much larger and plumper than those found in the glands, and may often appear as very large cocci. The capsule varies greatly in size, but is usually about twice as wide as the bacillus. The organism is rarely seen in a cell. It stains by all the aniline dyes, and quickly decolorizes by Gram's method of staining. When lightly stained with Loewler's alkaline methylene-blue, the organism frequently takes a bipolar stain, appearing very much like a diplococcus. If a smear is first stained by Gram's method, and afterwards lightly stained with methylene blue or carbol-fuchsin, a beautiful bipolar stain may be made.

The organism grows well in all the ordinary media. Twenty-four-hour-old colonies are small, round, even-edged, and almost transparent, with the center slightly milky. Under the microscope the colony is granular, slightly yellowish and darker in the center than about the edges. The edge is wavy, or more or less indented. At forty-eight hours the colony is somewhat larger, more opaque, and of a milky color.

On neutral plain agar-agar, at the end of twenty-four hours, a faint, translucent, slightly milky colored growth is observed. The growing edges are smooth and thicker than the central portion of the streak. The water of condensation is slightly turbid, with a slight whitish sediment at the bottom. At the end of forty-eight hours the streak is considerably larger than at twenty-four, slightly more opaque, and the edges are somewhat scalloped. No further important changes are noted in older cultures. When a portion of the culture is removed by a platinum wire a glutinous consistency is observed, the growth usually pulling out into long threads.

On blood serum a similar growth is seen, but slightly more opaque. No change in the media is noted.

On glycerine agar the growth is not so abundant as on plain agar.

On acid potato the growth is sparse, slightly moist, and of a very faint yellow color. No change on the potato is noted.

In bouillon the most typical growth is seen. The organism grows just under the surface of the bouillon, and on the sides of the tube. From the surface of the bouillon the growth projects downward in light, flocculent masses, which, on the slightest shaking, settle to the bottom. The bouillon remains clear.

No change is produced in litmus milk.

In litmus glucose agar-agar a slight reddening appears, which gradually extends through the entire media.

In glucose agar-agar stabs the growth continues along the entire stab, having a

whitish opaque appearance, and extending but slightly into the media. No gas is produced.

In peptone solution no indol is formed.

The organism from cultures does not, as a rule, take the bipolar stain, and the capsule, if present at all, is very much diminished in size. The organisms from the several media take all of the aniline stains, and rapidly decolorize by Gram's method of staining. On hanging drop, the organism has an active Brownian motion, but is not motile.

The diagnosis of plague bacillus in culture media is determined as follows: It decolorizes by Gram's method; produces no gas in glucose agar-agar; produces no change in milk; is non-motile; produces no indol; has the characters of growth as described for bouillon; is pathogenic for white mice, house rats, guinea-pigs, rabbits, monkeys, and all domestic animals.

The plague organism is long lived. From sterile paper, inoculated with a pure culture and kept in a dark place, the organism has been recovered after forty-five days. Sunlight destroys it within three hours. The bacillus is easily killed by the ordinary disinfectants, and is very susceptible to heat.

About a point of inoculation a local inflammatory swelling appears, with considerable cedema, induration, and hemorrhage. The nearest lymphatic glands are enormously swollen, hyperæmic, or hemorrhagic and oedematous. All of the lymphatic glands of the body are enlarged and hyperæmic. The spleen is enlarged, hard, and of a bright-red color, the anatomical structures being easily seen. Numerous hemorrhages may appear throughout the body. A more or less marked septicemia is noted. The animals die, as a rule, in from thirty hours to four or five days, usually from fifty to seventy hours. The duration of the disease does not seem to depend on the dose of the organism.

General pathological conditions.—The body is usually not emaciated, and the subcutaneous fat is normal in color. Rigor mortis is usually early and well developed. Ordinarily the onset of putrefication is delayed, except in secondary infections. General emphysema of the skin has been noted. The venous system is usually congested, and all of the organs are more or less hyperæmic or hemorrhagic. Parenchymatous and fatty degenerations are general. After the disease has become systemic, the bacilli are found throughout the body.

Skin.—The skin is usually dry and hot. Occasional outbreaks of perspiration may be noted; this is especially true in the pneumonic type. Some observers speak of an odor peculiar to plague. General cedema of the skin is not common, but may appear in cases complicated with nephritis. The appearance of hemorrhages in and under the skin varies greatly in different epidemics, and even in the same epidemic. In epidemics occurring during the fourteenth century, cutaneous and subcutaneous hemorrhages were common, giving rise to the name "Black Death." Hemorrhages may be divided into two classes, namely, the punctate hemorrhages into the deep layer of the skin, and the diffuse and often extensive hemorrhages into the subcutaneous tissues. The small punctate hemorrhages vary in size from a pin-point to one-half of a centimeter in diameter. They usually appear a few hours before death over the face and trunk, especially about the shoulders and on the extremities. Their outline is sharp, and no change in the skin is noted. They vary in color from bright red to almost black. The diffuse subcutaneous hemorrhages appear toward the end of the disease over the face, trunk, and upper extremities. They vary in size from one-half centimeter in diameter to an area of 3 or 4 by 6 or 8 centimeters, and resemble a bruise. The hemorrhagic tissue teems with bacilli. The skin about old scratches, insect bites, etc., is usually hyperæmic.

Writers of all ages have mentioned the occurrence of exanthematous eruptions. Under this title many lesions were included. During recent epidemics numerous observers have described such exanthematous eruptions. Roseolar spots have also been noted. In several cases occurring in Manila wheals have been observed. Herpes is most unusual in plague and has never been observed in plague-pneumonia.

Lymphangitis rarely occurs in plague. When found, it is usually associated with a primary carbuncle or bubo. Occasionally it occurs without apparent connection with either. When present, the surrounding tissues are hard, indurated, the skin is reddened, and there is more or less pain. In the event of a favorable termination the lymphangitis gradually subsides.

The pest carbuncle begins with a bluish-black colored spot, similar to a subcutaneous hemorrhage. Within a few hours or a day one or more small vesicles appear, which latter form one vesicle filled with a slightly bloody fluid. The fluid in the vesicle may contain a pure or mixed culture of the plague bacillus. Within a short time the vesicle ruptures, leaving a reddened, granulated surface, which is soon covered with a reddish-brown dry scab. The edges are more or less indurated, sharply defined, elevated above the center of the ulcer, and surrounded by a varying, ill-

defined hyperemic area of skin. Oedema accompanying the carbuncle may be very extensive. Associated with the carbuncle may be more or less lymphangitis. The size of the carbuncle varies from one-half to 5 or 6 centimeters in diameter. The superficial ulcer may spread rapidly after the vesicle is ruptured. This class of carbuncles is usually called primary. Some authors consider the primary carbuncle as a portal of entry. This is exceptional, as the portal of entry does not usually undergo an inflammatory process. Within two days after the development of the carbuncle the glands begin to enlarge and the fever develops. Carbuncles associated with the buboes occur later during the course of the disease. They are probably metastatic, and correspond to the second-order buboes. Carbuncles have no relationship to the severity of the attack.

During the course of the disease superficial vesicles may develop. These vesicles are formed by the accumulation of a bloody fluid under the epidermis, the base showing no inflammation, and the fluid usually containing the plague bacilli.

Muscles.—The muscles are usually of a dark color and dry. About the bubo more or less hemorrhage may be noted. The oedema accompanying the primary bubo of the first order rarely affects the muscles.

Bones.—The periosteum is injected, especially about the bubo. The bone marrow is normal, or slightly hyperemic.

Lymphatic glands.—The lymphatic glands seem to be the elective seat of development for the plague bacilli. From the symptoms and the pathological manifestations of the disease it is learned that the glands always play an important, if not the most important, rôle. This is due to the general lodgment of plague bacilli in them.

The pathological condition of, and the relationship between, the lymphatic glands will first be considered, as a knowledge of the process at work in this system is essential to the proper understanding of the disease.

For convenience of description the nomenclature of Albrecht and Cohn will be used: The gland showing the most pathological changes, usually the first gland infected, is called a primary bubo of the first order; glands belonging to the same chain or group of glands as the primary bubo of the first order, and infected by the passage of bacilli through the lymphatic vessels, are called primary buboes of the second order; glands in distant portions of the body, infected through the blood supply, are called secondary buboes.

PRIMARY BUBOES OF THE FIRST ORDER.

Lesions of primary buboes of the first order may be divided into (1) those involving tissues around the bubo, and (2) those affecting the bubo proper. The degree of pathological change associated with primary buboes of the first order naturally varies with the severity and duration of the disease. The distinction between a primary bubo of the first order and one of the second is more relative than absolute. The difference found may be explained, to a great extent, by the difference in time of the infection of the respective buboes. There are, however, two important distinctions, which are easily made out, namely, oedema, and periglandular induration, which are characteristic for a primary bubo of the first order.

The skin covering a primary bubo of the first order is usually slightly reddened, and may present, in the immediate neighborhood, either pustules or carbuncles. In the early stages of the disease, the skin is freely movable over the bubo, but as the bubo enlarges and the periglandular infiltration increases, this mobility is lost. Varying degrees of oedema, depending on the amount of oedema accompanying the bubo, are noted in the skin. The oedema associated with a primary bubo of the first order is absolutely typical. The amount is very varied, ranging from a slight serous exudation into the tissues between the muscles, to an extensive exudation, involving all the surrounding tissues, and even extending to distant portions of the body. The oedema accompanying the femoral bubo may be general from the knee to the thorax, and of the retroperitoneal tissue of the affected side, as far as the diaphragm. It is not uncommon for it to extend beyond the median line. When oedema is extensive, the natural grooves and contour of the affected part are, of course, destroyed. Cut sections through the oedematous tissues show a slight straw-colored, gelatinous consistency of the structures, from which a thin, light, straw-colored fluid slowly escapes. The blood vessels are enormously distended and punctate hemorrhages are frequently noted. The lymphatic vessels near the glands are also distended. Microscopical examination of the escaping fluid shows varying numbers of leucocytes, red blood cells and bacilli. This oedematous region is usually the last location suffering from secondary infection, and after death frequently pure cultures of the plague organism may be obtained here, when in all other portions of the body mixed cultures are found.

The tissues immediately surrounding these buboes are infiltrated with small, round

cells and some leucocytes, and present varying degrees of hemorrhage. The infiltration appears generally from 24 to 48 hours after the bubo begins to develop, and naturally limits the mobility of the gland. When the primary bubo is one of a group of glands, the infiltration obliterates the outlines of the individual glands, making one solid, immovable mass. The accompanying hemorrhages vary greatly in degree, ranging from a condition of extreme congestion to massive hemorrhages.

The primary bubo may vary greatly in size, ranging from a normal-sized hyperæmic gland to a bubo as large as a hen's egg. In rapidly fatal cases, death occurs before the glands have time to enlarge. In these cases septicæmia develops early; the glands may be slightly enlarged, hyperæmic, or more or less hemorrhagic, and œdematous, the surrounding tissues being œdematous or hemorrhagic. The œdema and periglandular infiltration of the surrounding tissues may be absent. When a bubo is well developed the gland is usually hard, and the cut section shows the capsule stretched, more or less hemorrhagic, and infiltrated. The cut surface of the glands bulges, is œdematous, more or less hyperæmic, and hemorrhagic. Portions of the glands not hemorrhagic or intensely hyperæmic are usually of a grayish color, with a faint yellowish tinge. Hemorrhages may be located in the cortex or extend throughout the entire gland. Oftentimes they follow the lymph sinuses. The center of the gland is usually soft, but pus is rarely found, except late in the disease. Microscopically a general coagulative necrosis, leucocytes, red blood cells, and masses of bacteria are seen in addition to the normal elements of the glands. Considerable fatty degeneration is usually present, especially near the center of the gland. Proliferation of the endothelial cells lining the lymph sinuses is seen in the earlier stages of the processes. With the hæmatoxylin and eosin stains the bacteria appear as faint blue masses.

PRIMARY BUBOES OF THE SECOND ORDER.

As stated above, these buboes belong to the same chain or group of glands as the primary bubo of the first order, and receive their infection from the first-order buboes through the lymphatic vessels. As a rule, the second-order buboes are not as large as the first, and are never surrounded by the œdema and periglandular infiltration, except when immediately associated with first-order buboes. The glands are usually freely movable, hard, and surrounded by more or less hemorrhagic tissue. The capsule is distended, and on cut section the gland substance bulges, is œdematous, hyperæmic, more or less hemorrhagic and soft in the center. The substance of the gland when not entirely hemorrhagic or hyperæmic is of a grayish color. Rarely is pus seen. Histologically, the first pathological changes are noted in the lymph sinuses, where may be seen a proliferation of the endothelial cells lining the sinuses, lymphocytes, leucocytes, red blood cells, and bacteria. More or less coagulative necrosis is seen along the course of the sinuses. The process rapidly extends throughout the glands, producing a picture similar, but less in extent, to the primary bubo of the first order.

SECONDARY BUBOES.

As before stated, the secondary buboes are those infected through the blood supply, and may include all of the remaining glands of the body. They are small, freely movable, œdematous, hyperæmic, and occasionally hemorrhagic. Histologically the glands show œdema, hyperæmia, and a necrosis of the elements in the center of the lymph follicles.

FREQUENCY AND LOCATION OF BUBOES.

In the greater proportion of cases of bubonic plague buboes are found. Russel records their presence 2,641 times in 2,700 cases, or 97.8 per cent; Wilms, in Hongkong, found 73 per cent. The percentage naturally varies in different epidemics.

All observers have found the femoral and inguinal buboes most common, the axillary next in frequency, and the cervical least often. Russel gives the following percentages:

Inguinal buboes, including femoral.....	per cent..	69.70
Axillary buboes.....	do.....	21.54
Cervical buboes.....	do.....	8.76

The following percentages in the sexes are given:

Inguinal and femoral buboes:		
Male.....	per cent..	45.35
Female.....	do.....	34.81
Children.....	do.....	19.84

Axillary buboes:

Male.....	per cent..	36.20
Female.....	do.....	31.63
Children.....	do.....	32.17

Cervical buboes:

Male.....	do.....	25.10
Female.....	do.....	24.67
Children.....	do.....	50.23

These percentages closely agree with those given by other observers.

SPECIAL BUBOES.

A femoral bubo, when well developed, stands out prominently, and the edema of the surrounding tissues is easily visible. The gland is hard, but the surrounding edema may give a semi-fluctuating sensation. The inguinal glands may or may not be infected, as a group; frequently only one gland is enlarged. One or more, or all, of the iliacs, lumbar and pelvic glands of the same side may be affected. The edema accompanying the femoral bubo may extend through the retroperitoneal tissue of the same side. The secondary buboes may be individually surrounded by hemorrhagic tissues, or the entire retroperitoneal tissue may be one mass of hemorrhagic tissue. The same process may extend into the pelvis. The involvement of the lumbar glands may cause a back flow of lymph in the side opposite the primary bubo of the first order, causing second order buboes. With a femoral primary bubo of the first order we may have primary buboes of the second order, involving the inguinal and iliacs of both sides, or the lumbar and femoral of the opposite side. Other glands involved would be secondary buboes.

An inguinal primary bubo of the first order gives more or less the same picture. In this case the femoral of the same side, the iliacs of both sides, the inguinal and femoral of the opposite side, and the lumbar, would be second order buboes. The remaining glands enlarged would be secondary buboes.

The axillary primary bubo of the first order presents the same edema, etc., as above described. The remaining glands of the axilla and the chain extending along the vessels into the thorax, are the second order buboes, and may present the varying degrees of hemorrhage. The back flow of lymph may carry the infection to the glands of the neck and to the opposite side of the body.

The cervical primary bubo of the first order has the same characteristics. The cervical glands along the vessels are the second order buboes, while the back flow of lymph may carry the infection to the axilla of the same side, and to the opposite side of the neck. All involved glands not mentioned are secondary buboes.

In a small percentage of cases primary buboes of the first order are noted in widely separated regions, such as the axilla and groin of opposite sides, or cervical region and groin, or axilla and groin of same side. In these a double infection has probably taken place.

DEVELOPMENT OF BUBOES.

Buboes of the first order usually appear from the second to the fourth day of the disease; in some cases, however, the glands begin to enlarge with onset; while in others indefinite pains may be experienced at the site of the future bubo, before the development of the usual first symptoms. The development of the bubo is usually rapid, reaching its height from the sixth to the tenth day. In the greater proportions of cases death occurs before suppuration. Suppuration comes on during the second week of the disease, and is usually caused by organisms other than the plague bacillus. In a small percentage of the favorable cases suppuration does not take place. In these cases resolution occurs. Pain is usually most intense, causing the patient to assume any position which serves best to reduce pressure on the bubo of the surrounding parts and clothing. Often the pain is too severe to allow of palpation. When the active processes reach their limit pain usually subsides, to reappear when suppuration begins. When opened after suppuration, the bubo is frequently very slow in healing and, in some cases, gangrene may develop. These sequelae are due to the general lowered vitality of the patient.

The second-order buboes appear shortly after the first order; in some cases the two classes seem to develop at the same time. When the first-order bubo is one of a group of glands it is often difficult to determine which is the first and which the second-order bubo. In the early stages of the disease the individual glands can be made out, but later they form one mass of immovable tissue. The pain accompanying the second-order bubo is, as a rule, not so severe as that accompanying the first order. The fate of the second-order bubo is similar to that of the first order. In

favorable cases second-order buboes, located within the abdomen, may suppurate, giving rise to serious complications.

Secondary buboes, as a rule, do not develop until the disease becomes general, or until septicæmia occurs. The toxins circulating in the blood may cause some general glandular enlargement. More or less pain is associated with the secondary buboes, but never equal to that of the first or second order.

Respiratory tract.—The nasal mucous membrane shows nothing, except occasional hemorrhages. Varying degrees of congestion and œdema are seen in the larynx. The mucous membrane of the trachea may be more or less injected and sometimes shows true inflammation. The lungs are more or less cedematous and congested, while varying degrees of bronchitis or broncho-pneumonia may be present. The pleura often shows punctate hemorrhages, both in the parietal and visceral layers; pleural hydrops may occur, especially late in the course of the disease. The glands at the base of the lungs are usually enlarged, and more or less hyperæmic. The mediastinal glands are enlarged, more or less hyperæmic and hemorrhagic.

Circulatory apparatus.—During life, the heart is one of the first organs to show the effects of the toxins circulating in the blood. From the beginning of the attack it is more or less dilated, its action usually weak, and frequently a systolic murmur is heard.

The pulse ordinarily runs from 90 to 100 beats per minute. Frequently, however, the rate increases to 180, or even 200 beats. In the beginning of the attack, the pulse is usually full, fairly strong, resembling the ordinary fever pulse. Within a short time, however, it becomes weakened, oftentimes dicrotic, small, and easily compressed.

The vessels of the pericardial sac are usually congested, occasionally showing a few hemorrhages. The sac contains more or less light-colored fluid. The heart is usually distended, and the superficial vessels engorged. Frequently numerous sub-pericardial extensive hemorrhages are noticed, especially over the left auricle and ventricle. The muscles are flabby, soft, more or less cloudy, and often show fatty degeneration. The valves and endocardium are usually unaffected, except for an occasional subendocardial hemorrhage. Histologically, the heart muscles show more or less parenchymatous change, with varying degrees of fatty degeneration. The vessels are congested, frequently containing a large number of leucocytes. Some red blood cells may be scattered throughout the tissues.

The arteries are usually not affected. In the neighborhood of buboes, hemorrhages may be noted into their outer coats. The veins about the buboes are usually studded with hemorrhages, which involve the entire wall. The induration about the bubo may include the veins. In these locations a favorable opportunity is offered the bacilli to enter the general circulation.

Alimentary canal.—The mucous membrane of the mouth is usually dry, more or less congested, hemorrhagic, and the lymphoid structures may be slightly swollen. The tongue is usually swollen, cedematous, and heavily coated white. As the disease progresses, the coat may become of a reddish-brown color, especially along the middle. The papillæ are usually prominent and congested. The salivary glands are rarely affected, except in cases of cervical primary buboes. The tonsils may be enlarged, hyperæmic, and even necrotic. The pharynx is usually congested. The œsophagus is not affected.

The mucous membrane of the stomach is usually covered with a dirty, brown, mucoid material, which contains more or less blood. Frequently it is studded with punctate hemorrhages, which may sometimes involve the entire wall. The lymphatic structures may be swollen. The mucous membrane of the intestines is usually more or less hyperæmic, and frequently presents, especially in the duodenum, numerous punctate hemorrhages. The lymphatic structures are usually more or less swollen and hyperæmic. The entire gut may be more or less bile stained. The mesenteric glands are usually enlarged, hyperæmic, and may be hemorrhagic. About the cœcum, the group of glands is occasionally palpable.

The saliva in ordinary cases presents nothing of interest. It contains the plague bacilli when the disease has become general. In pneumonic cases the saliva may become increased and contain more or less blood and bacilli.

Diarrhœa or constipation may occur. The bacilli may be present in the dejecta. More or less pain throughout the abdomen may be present, due, doubtless, to the enlarged mesentery glands. Frequently when the pain is located about the cœcum, and when the tumor mass above referred to is palpable, especially in the absence of the other symptoms of plague, it may be difficult to differentiate it from acute appendicitis. Pain in the epigastrium is common, and is often associated with nausea and vomiting.

Peritoneum.—The peritoneum is usually dry and the vessels congested. In some

cases a varying amount of straw-colored fluid is present. Occasionally, patches of peritonitis are seen over an iliac bulbo.

Spleen.—The size of the spleen in well-marked plague cases varies from normal to three or four times original size, and may or may not be palpable during life. A typical plague spleen is firm, capsule tense, pulp substance increased, of a bright brick-red color, with more or less hemorrhages about the malpighian bodies or into the pulp substance, and oedematous. The trabeculae are usually prominent. The diffuent spleen is not seen in plague except in mixed infections. Microscopically, the tissues are widely separated, with the small cells and the polymorphonuclear leucocytes increased, and desquamation of the endothelial cells lining the spaces. Varying degrees of hemorrhages may be noted throughout the tissues, especially about the malpighian bodies. The fixed elements usually show a cloudy protoplasm, with more or less fatty degeneration, and a diminished amount of nuclear material.

Liver.—The liver is usually somewhat increased in volume and congested. The surface may present many or few hemorrhagic areas about the longitudinal ligament and areas of fatty degeneration. Cut section shows degeneration, varying degrees of cloudiness, and a more or less bile-stained condition of the organ. Microscopically, parenchymatous and fatty degeneration are apparent. The nuclei stain faintly or not at all. The vessels are more or less distended.

Urinary system.—The kidneys often present marked hemorrhages into the capsule throughout the organ and in the pelvis. Parenchymatous and fatty degeneration and varying degrees of congestion occur. The ureters are not affected, nor is the bladder, except occasionally punctate hemorrhages may be noted in its mucous membrane. Cystitis has been observed.

The urine presents the ordinary changes seen in acute infectious diseases. Occasionally, from the third to the fourth day, a large amount of albumen, hyaline casts, and red blood cells are seen. Accompanying these changes in the urine may be more or less oedema of the subcutaneous tissues.

Generative organs.—Ordinarily no lesions are noted in the male generative organs. The German Plague Commission recorded one case of primary carbuncle on the penis. Oedema of the scrotum may be associated with femoral and inguinal primary buboes of the first order. The female organs of generation are rarely affected, though some oedema of the labia may occur. Hemorrhage from the uterus is not uncommon. In pregnant patients, abortion is usual; the child may or may not be dead.

Nervous system.—The membranes of the brain and cord are more or less injected, hemorrhagic, and oedematous. A few cases of plague meningitides have been observed. The brain and cord may be congested and oedematous. The ventricles usually contain an increased amount of fluid, and the choroid plexuses are hyperemic. Throughout the body more or less hemorrhage may be noted in the sheaths of the nerves.

The derangements of the nervous system depend more upon toxic influence than upon direct pathological change. Usually during the prodromal stage of the disease no derangements are seen. When observed, they are similar to those of other infectious diseases: Weakness, indefinite feelings of sickness, dizziness, loss of appetite, headache, general pains throughout the body, etc. During the early stages, headaches and dizziness are common. Headache is usually severe and may be of the occipital or frontal type, or pain may extend throughout the whole head. Headache may continue through the entire course of the disease, presenting one of the most difficult symptoms for treatment, or it may be temporary or periodical. It usually disappears when the convalescent stage begins. Dizziness may be well marked, and may vary in a manner similar to the headache. When present it may cause the patient to have a drunken gait.

The condition of the general sensorium varies greatly in different cases. General weakness is usually noticed at the onset of the disease, and all degrees of the typhoid state, to complete coma, may be observed. These conditions may develop at any time during the course of the disease, and may be as well marked at the onset as later. General prostration is usually well marked. Frequently the patient is so weak as to be scarcely able to answer questions or to move about in bed. Often when in this condition the patient passes into a dreamy state, which may be only temporary, or which may gradually increase until complete coma results. Coma may develop at any stage of the disease, and be of a transitory nature, but more usually it continues until death. Delirium may develop at any time, and apparently does not depend upon the degree of the fever or of the severity of the attack. Practically all types of delirium may be noted during an epidemic, from the simplest illusions to the most violent motor disturbances. Substus tendinum, spasm, convulsions, stiffening of the neck, etc., may accompany the delirium. Hallucinations and mania may be present.

Paralysis of different sets of muscles, of different members, or of the entire body may occur. Frequently, varying degrees of aphasia are noted. This symptom may be due to central disturbances, or to local interference of a cervical bubo, or the edema with the vocal apparatus.

Blood.—A drop of blood from puncture of the ear seems more watery and of a lighter color than normal. If drawn when the circulation is beginning to fail, it may be more or less venous in appearance. No change is noted in the red blood cells. Leucocytosis of the polymorphonuclear type is usually present from the beginning of the disease, varying from eight to forty-five thousand, or even higher, according to some observers. The blood platelets are usually increased in number.

Early in plague the blood is practically free from organisms. Gradually the organisms gain access to and rapidly multiply in it as the disease progresses. The bacilli enter blood either through the lymphatic vessels or by direct growth through the walls of the veins in the neighborhood of the bubo or buboes. During the later stages of plague and at autopsy the bacilli are practically always present. In cases upon which systematic blood examinations have been made, bacilli have been found from twenty-four to forty-eight hours before death. When organisms first appear in the blood, only a few may be seen on each slide. Often only one is found. The number rapidly increases, and frequently the blood is, just before death, practically a pure culture of the plague bacillus. The bacilli occur in the blood singly, in pairs, in chains of from four to five, and in clumps. Then capsules and characteristic staining are easily demonstrated. Appearance of the bacilli in the blood naturally gives an unfavorable prognosis.

From what has been said it is evident that examination of the blood is of very little diagnostic value during early stages of the disease, but later is of the utmost importance. During an epidemic the leucocytosis and increased number of blood platelets are important points in the diagnosis, even in the absence of bacilli, especially in differentiating from malaria and typhoid fever.

Fever.—Plague does not present a characteristic fever curve. The fever may be a simple continuous fever, or may remit, and even intermit. Morning depression and evening elevation are usual. The variation is usually from one to two degrees. Occasionally fever is noted for twenty-four to forty-eight hours after the onset of the disease, followed by normal temperature for twenty-four to forty-eight hours, and then sudden rise in temperature with severe symptoms and death. In one case of this kind observed the patient died within ten hours after the second onset of fever. Frequently the temperature is seen to drop below normal, to be followed within a few hours with a sudden rise and death. Temperature in plague cases usually varies between 102° and 104° Fahrenheit; occasionally 107° has been noted. Height of fever does not seem to bear any relation to the severity of the attack or to the accompanying delirium. Temperature rarely terminates by crisis, but usually gradually subsides to or below normal. A subnormal temperature during the convalescent stage is very common. Fever continues from six to ten days. In the event of the suppuration of the glands the fever shows the ordinary septic type. This type of fever may develop during the later stages of the disease, or some days after the true plague temperature has become normal. On opening the bubo the temperature usually rapidly falls. The degree of fever in plague is easily reduced by the cold bath, but is little affected by the ordinary antipyretic drugs.

Special senses.—During the height of a plague attack deafness may develop, especially in hemorrhagic cases, and in those with cervical primary buboes of the first order. Prognosis is usually favorable.

The conjunctivæ are more or less injected, and true conjunctivitis may supervene. Keratitis, iritis, and panophthalmitis may occur.

Epidemiology—Portal of entry.—Experience has shown that plague is usually, if not always, an infectious disease, and that the organism must actually be introduced into the system before infection can take place. It is difficult, and usually impossible, to tell in a given case the portal of entry.

There is usually no local reaction about small scratches, etc., which are frequently seen on the extremities when a femoral, inguinal, or axillary bubo is present. Circumstantial evidence goes to show that the organisms gain access to the system through an abrasion of the skin. This abrasion may be either gross or microscopic. From the tissues about the abrasion the bacilli are taken up by the lymph and carried to the lymphatic glands.

The organisms may enter through the external mucous membrane, especially in children. Infection may also occur through the alimentary tract, especially when cold food is used. Inhalation of infected dust in factories or of dried sputum from pneumonic cases is another method of infection, the bacilli entering through the air passages or lungs. It is quite possible to contract the disease through sexual intercourse. In one of my cases this seemed to be the most probable avenue of infection.

Incubation period.—From time to time many experiments have been accidentally performed, which served in a way to determine the period of incubation. From these experiments, and from the large number of people kept in isolation camps it has been found that from two to ten days is the ordinary limit of the period of incubation, usually from three to six or seven days. During the epidemic in India in 1896 and 1897 no case came under observation with an incubation period longer than ten days. Some authors, however, claim that it may be as long as fifteen days.

Direct transmission.—Excretions from the patient, hemorrhages from the nose and lungs, menstrual flow, vomitus, feces, secretions from pustules and carbuncles, and pus from the bubo contain the bacilli in varying numbers. Any or all may serve as the medium of direct infection. The bacilli have not been demonstrated in the perspiration. In air the plague organism has a very short life; when exposed to direct sunlight it is killed within three hours. An infection may occur while handling any of the above-mentioned excretions, or the bed clothing, etc., used by a patient. The sputum is of especial importance, as the patient may, with this secretion, infect a very large area; this is especially true in plague pneumonia. Naturally the cadaver is infected.

Indirect transmissions.—The plague organism, even when dry, has an indefinite life under certain conditions. Nonexposure to light does much to lengthen this period. Clothing, exposed fabrics, or dust or merchandise infected by means of dead rats or by handling in places where plague existed, or in whatever way infected, may transmit the disease. In this laboratory the plague organism was recovered from dry paper kept in a thermostat for forty-five days. How much longer it would live has not yet been determined. The organism of plague has not yet been found in the esteros or sewers of Manila, but there is no reason to doubt that it might live for considerable time in these locations. Kitasato has found the bacilli in fabrics brought from Bombay. Infected rooms, not properly disinfected, may serve to transmit the disease. Cadavers, even when buried, harbor the organism. Experiments are now being carried on to show how long the bacillus lives when so buried. Thus far, it has been recovered after two months. It has not yet been determined whether the infection is carried in water. Numerous cases are on record where infection has been carried by clothing, etc., which had been packed away for months.

Spreading of the disease is favored by unhygienic conditions, and crowding of dwellings. Individual habits also play an important part. In practically all epidemics, in whatever part of the world, the larger proportion of cases has occurred in sections of the towns having the smallest and poorest ventilated houses, with defective drainage and water supply. In these particular districts people usually crowd together and live under the filthiest conditions. In the better portion of a city infected with plague but few, if any, cases occur.

Spreading of the disease.—Plague infection may be carried from place to place in various ways. Among others, the removal of a person sick with the disease is an important means, as is also the arrival from an infected place of a person who has been exposed to contagion and for whom the incubation period has not elapsed. Under these circumstances the organisms are spread about in the feces, urine, sputum, and to some extent in the bed clothing of the sick person; the well, of course, not carrying the infection except by clothing, etc., until attacked by plague. The nature of the disease and the precautions to be taken against it are unknown to the general public, therefore its further spread may be easily accounted for. It has been noted that ordinarily first cases imported into a new field attract little attention, as but few cases immediately follow the infection. Bacilli have been found in fabrics brought in bulk from infected ports. This is a most dangerous method of spreading the disease, as these fabrics enter a new field and are handled by the inhabitants, who are thus brought into direct contact with the organisms. The disease may in this way be spread over a large area before its true nature is discovered. The emigration of rats from district to district is also an important factor in the spreading of the plague. Infected rats from ships may also carry the disease from one country to another.

Extension of the epidemic.—When introduced into a new district, plague does not make rapid progress at first. Usually considerable time elapses between each case, and the disease may linger practically without manifestation for one, or, possibly, for two or more years. During this time, however, different areas are becoming infected. These later serve as starting points for a more or less extensive epidemic. Even with beginning epidemic prevalence, the disease spreads slowly, not going from house to house and from district to district, but jumping from one house to a distant one, in the same or neighboring blocks, or in an entirely different part of the city. This is undoubtedly accounted for by the visiting of people in the infected house, or by the using of commodities bought from an infected store. As time goes

on, the number of infected places naturally increases, and with this increase an increased number of cases of the disease may be looked for. In an infected city these infected areas may be considered to be the endemic location of the disease for that particular city.

The yearly duration of an epidemic of plague is usually but a few months; rarely does it last longer than six. The majority of the cases occur within two or three months. As a rule, an epidemic of plague has a rather sudden decrease toward the latter part of its course. A few mild cases are noted, however, from time to time for some months after the epidemic has subsided. When once introduced, plague continues from year to year, with an occasional intermission of a year, for an indefinite time. The disease is kept alive during the intervals between the epidemics by mild cases, infected fabrics, houses, etc.

Duration of the disease.—According to most observers, the larger proportion of deaths occurs within the first eight days, usually from the third to the fifth. In severe forms of pest, death may occur within twenty-four hours after onset of the first symptoms. When death occurs late during the second week of the disease, secondary infections are usually present. The average duration of symptoms of plague proper is from six to eight days. Secondary infections may prolong the attack from four to six weeks. The convalescent period may be short or long drawn out, due to the severe prostration caused by the attack. Emaciation accompanying a short attack may not be noticeable, but is usually well marked in severe attacks of long standing. General extensive necrosis of all of the organs predisposes the convalescent to secondary infections: suppuration of buboes, parotitis, skin abscesses, suppuration of the middle ear, etc. During the convalescent period, recrudescence of the disease may occur from the first to the eighth week. The prognosis is unfavorable. The same individual may be subjected to two or more attacks of plague, occurring at shorter or longer intervals. Therefore attacks confer only a relative immunity.

Plague among animals.—Plague has been found in practically all the domestic animals. From earliest times writers have noted the susceptibility of rats and mice during plague epidemics. In I Samuel v and vi, plague is mentioned as existing among the Philistines, and the pollution of the fields by mice is noted. To counteract this pollution the Philistines made gold images of mice to appease the gods. Avicenna, in 1000 A. D., says that when rats are affected with plague they come out of their holes and act as if drunken. Nicephoros Gregaros, in 1348 A. D., says that rats are affected by plague, and come out of the walls of the houses, etc. He also mentions that dogs and horses are affected. In recent years rats have undoubtedly played an important rôle in the propagation of plague. In numerous instances, before the existence of plague became generally known, large numbers of dead rats have been found in streets, alleyways, etc. Usually during a severe epidemic among the rats they emigrate, evidently to escape the sickness. In this way they carry the disease from district to district. Epidemics are not always noted among rats, even when many people are affected with plague. There is no doubt as to the nature of the disease in the rat, as numerous observers have made careful studies and autopsies and have invariably found evidences of true plague. The source of plague in this animal has not yet been definitely determined and, indeed, is a difficult question to settle. As the plague organism is probably long lived, rats may acquire the disease from some old fabric which was formerly infected with plague, pick up the organism in the ground, or receive the infection from a patient sick of plague. In these instances what might otherwise be a harmless organism may, on new soil, become virulent. From time immemorial, insects, fleas, mosquitoes, etc., have been believed to play an active part in spreading plague, and only recently has the opinion been advanced that fleas are the active agents in spreading the disease from rat to rat, and from rat to man.

Climatology.—The history of epidemics of plague shows that the disease may flourish in the tropic, temperate and frigid zones, at the sea level, and at high elevations, and during all seasons. When once introduced into a locality, plague seems to favor certain seasons of the year, and the yearly epidemics follow these seasons with great regularity. In the Tropics the ending of the cold season and the beginning of the hot, dry season is the favored time. It has been noted that when the temperature reaches its highest point plague begins to decrease. At the end of the dry season and the beginning of the rainy season the epidemic is practically ended. A few cases appear from time to time during the entire rainy season.

Age, sex, race, and occupation.—Age seems to have but little importance as to susceptibility to the disease. Children and old people are alike affected. The great majority of cases, however, range between 20 and 40 years. After 50 years the number of cases is proportionately small. The disease is about equally distributed between the two sexes. All races are alike prone to infection. The few cases occur

ring among Europeans is due more to social conditions than to racial immunity. Laborers at all trades are affected, but it has been noted that those continually working in water and oil rarely contract the disease.

Plague may be associated with any of the ordinary diseases, and its severest type often accompanies diseases of a chronic nature.

Mortality.—Mortality in the several epidemics of plague varies greatly, ranging from 30 per cent to 93 per cent. In Manila, in 1900, the mortality was 73 per cent, including all cases.

Methods to be used when the presence of the plague is suspected.—An early diagnosis of first cases is essential. This may be made by a thorough microscopical and bacteriological examination, or, in the event of death, by autopsy. The agglutination test is of diagnostic value; it is usually positive after the ninth or tenth day.

Suspected cases should be isolated and closely observed. Those associated with the suspected cases should also be isolated in a detention camp for at least ten days. The effects and dwelling of the suspected case should be thoroughly disinfected. Unhygienic localities should be cleaned and disinfected. It would be cheaper to destroy these sections than to endure from year to year expensive methods of handling the disease and the check to commerce usually experienced.

The plague hospital or detention camp should be in an isolated spot and so constructed that all of the infectious material may be easily sterilized.

Methods pursued in combating an epidemic.—The ordinary methods pursued are: Searching for and removal of sick; isolation of those known to have been exposed to the disease; cleaning and disinfection of houses in which sick have been found, including its surroundings, furniture, clothing, etc., used by the occupants.

Early removal of sick reduces to a minimum the amount of infectious material which they may scatter in their immediate vicinity. Information regarding sick is obtained either by house-to-house inspection or by dividing the city into districts in which the inhabitants are required to report all cases of sickness to the nearest health officer, whose duty it is to diagnose and dispose of each case. Positive and suspected cases of plague should be transferred to the hospital. Those exposed to contagion should be isolated, preferably near the plague hospital. Ten days is the usual period of isolation.

The house and surroundings should be thoroughly cleaned and disinfected. For this purpose, carbolic acid, bichloride of mercury, tricesol, or any other cheap, reliable disinfectant may be used. The furniture should be washed with disinfectants, and the clothing, etc., especially that used by the sick, should be disinfected by steam or soaked in a 3 to 5 per cent solution of carbolic, or a 1 to 1,000 bichloride solution, for one hour.

The general hygiene of the infected locality should be improved. A systematic cleaning of houses, yards, streets, and sewers should be carried out. An attempt to exterminate the rats should be made. This may be done by poison, depriving them of their hiding places, etc.

The inhabitants of infected localities should be taught the nature of plague, and the individual precautions to be taken against it. This may be done through the newspapers, posters in each dialect and language, schools, churches, etc.

Individual prophylaxis.—Those coming in direct contact with the disease should disinfect the hands with carbolic acid or bichloride of mercury immediately after exposure. When cuts, scratches, etc., are on exposed parts, infectious material should not be handled. General cleanliness should be maintained. The clothing should be covered; the feet protected; recently cooked food, only, used, and infected localities, houses, stores, etc., as far as possible, avoided.

Quarantine regulations can not be too rigorously enforced.

No passengers nor animals should be allowed to leave the infected port except in the case of passengers after a period of detention of ten days; all baggage and cargo should be thoroughly disinfected. If during an ocean voyage of more than ten days' duration plague does not develop aboard ship, the passengers may be allowed to land; otherwise, a quarantine should be established, and the effects of the passengers, cargo, and ship should be disinfected.

General clinical observations.—Writers on plague have given many distinct forms to the disease, but the following completely cover the ground: *Pestis minor*, *pestis bubonica*, *septicemic plague*, *pneumonic plague*. Of these, the bubonic type is most common, the septicemic form second in frequency, and *pestis minor* predominant before and after an epidemic.

Pestis minor is often noted many months before and after the real epidemic of plague. It may appear in sporadic cases or in a light epidemical form. Usually, when isolated, one or more buboes develop, with more or less fever. The symptoms are, as a rule, light. The organisms may be found in the bubo and the blood, but,

as a rule, are not highly pathogenic. The bubo may go on to suppuration or resolution. Afterwards, severe epidemic cases are seen, in which a single gland or group of glands is enlarged, painful, associated with more or less debility, dizziness, headache, sleeplessness, some disturbance of digestion, and more or less fever. The nature of these cases is, in part, determined by the place of dwelling. They most frequently develop in houses in which plague was common during an epidemic.

The bubonic type.—Ordinarily, onset of the disease is sudden, without any prodromal symptoms whatever. Occasionally a train of prodromal symptoms may be noted for twenty-four to thirty-six hours before the onset of fever. These symptoms are usually a general bad feeling, weakness, light chills, pains in the legs, some headache, sleeplessness, and loss of appetite. There may be some vomiting and dull pain about the seat of the future bubo. Usually, as stated, the disease begins suddenly with a fever. The fever may rise suddenly, reaching its highest point during the first day of the disease, or it may gradually rise, taking from two to three days to reach the fastigium. The onset of the fever may be accompanied with an initial chill of varying intensity. In addition to the initial chills, chills of more or less severity may continue at irregular intervals throughout the course of the disease. These chills do not seem to bear any direct relationship to the course of the fever or to the severity of the attack. The bubo usually develops from the second to the fourth day of the disease. Patients are usually admitted to the hospital during the bubonic stage. The following general conditions have been noted: Perspiration apparently greatly diminished, or entirely absent; occasionally more or less profuse periodical perspirations; skin usually oedematous, especially on the extremities; frequently intense itching; some pain in skin from time to time; over the bubo more or less reddening; skin usually dry and hot.

In the early epidemics of plague, subcutaneous hemorrhages were evidently more frequent than in recent ones. Ordinarily, hemorrhages do not appear until late in the course of the disease, or just before death.

The facial expression is often most peculiar, and, when once seen, can never be forgotten. It seems to be a mixture of pain, fear, and anxiety. The eyes may or may not be deeply sunken, and dull in appearance. The pupils are usually slightly dilated; in some cases the eyes have a fixed, staring appearance. Convergent strabismus is frequent.

The tongue is usually heavily coated white, and later during the disease is of a brownish color along the center. The papillæ usually stand out prominently and the edges are bright red and oedematous. The entire tongue seems to be swollen. The pharynx is usually reddened and may be deeply congested. The tonsils do not show any constant symptoms. The veins of the neck are usually distended and pulsating.

The movements of the two sides of the thorax are equal. Palpation usually shows the vocal fremitus increased. The percussion note may be somewhat defective, and auscultation usually reveals a slightly roughened breathing sound, with more or less moist rales. Respiration is usually somewhat shallow, apparently labored, and increased in frequency, often reaching a rate as high as fifty or sixty per minute. This is undoubtedly due to the extreme congestion, oedema, and bronchitis or bronchopneumonia noted in the lungs. The heart is usually somewhat dilated, the area of pulsation increased and a soft systolic murmur audible. The pulse is weak, often dicrotic, small, and easily compressed. The rate is usually increased, ranging from 90 to 140, or even as high as 180, beats per minute.

The abdomen usually presents nothing of interest. Seldom is the spleen palpable and the liver is usually normal in size. When the mesenteric glands are markedly involved, considerable pain may be felt over the entire abdomen. Occasionally the involved iliac glands may cause considerable pain.

The urine presents the usual febrile characteristics, diminished quantity, with some blood and pus cells. Occasionally there may be a complete anuria. There may be either diarrhea or constipation.

As has been noted, the primary bubo of the first order may be preceded by indefinite pain in advance of the usual initial symptoms of the disease. Beginning with the initial symptoms, the glands may begin to enlarge and be very painful. Ordinarily, however, the glands do not begin to enlarge until from the second to the fourth day of the disease. The rapidity of the processes at work in the glands varies greatly. Within a few hours the gland may reach its largest size; ordinarily, however, the process requires from two to four days. During the stage of development of the bubo the pain is usually severe. In comatose cases, pressure on the bubo may elicit evidences of tenderness when other attempts fail to arouse the patient. When the bubo is fully developed, the pain usually diminishes in intensity or entirely disappears. In the event of suppuration more or less pain may be present. In

favorable cases suppuration usually occurs during the second week of the disease. The second-order bubo rapidly follows the primary bubo of the first order. The characteristics of the second-order bubo have already been described.

Affections of the nervous system above described may be present. The prostration is, perhaps, the most constant symptom accompanying plague, and is usually found in a degree not to be seen in other infectious diseases.

The facial expression, increased pulse, rapid respiration, extreme prostration, and the presence of buboes present a striking, characteristic picture which can not be confounded with that seen in any other disease. Naturally, the prominence of each symptom varies greatly.

Septicemic plague. This is the most virulent form of plague and usually begins without any premonitory symptoms, with high fever and general collapse. Symptoms noted in the early stages of the disease are practically the same above described, except of a severer type. The pulse is usually very rapid, extremely feeble, and may be intermittent. Delirium may be present, and coma may develop early in the disease. The spleen can frequently be felt, and all the glands of the body are somewhat enlarged, without any primary buboes of the first order. There may be severe pains in the stomach, with frequent vomiting of blood. Blood may also be found in the stools and the urine. Prostration is usually severe. Bacilli are found in the blood from the beginning. Death may occur in this form of the disease within twenty-four hours after the onset of the first symptoms.

Plague pneumonia.—From descriptions found in some of the older writings, it is evident that plague pneumonia has existed in all epidemics, possibly to a greater extent formerly than now. Childe first determined the true nature of the train of symptoms which had been previously observed.

The pneumonia naturally divides itself into primary and secondary forms. The primary pneumonia is the form of plague usually styled "plague without buboes." The secondary pneumonia may be caused by infection through the circulation or by inhalation of infected matter from the upper air passages. The onset of the disease is usually sudden and without any prodromal symptoms. It is commonly ushered in by a chill of greater or less severity. Frequently this chill is followed in a few hours by a second chill of varying intensity. Occasionally no chill is experienced. The general condition of a patient usually seen in the ordinary type of plague immediately follows the chill, and for a time it is impossible to determine whether the disease will assume a bubonic or pneumonic type.

The number of cases of primary pneumonia, which have been closely studied from the onset of the disease, has been limited, but from these it has been found that the pneumonic symptoms usually develop from the second to the fourth day. Commonly, more or less cough is present, associated, as a rule, with an increased amount of expectoration. Varying degrees of dyspnea and cyanosis may accompany the cough. The rusty sputum of lobar pneumonia is not present. Associated with the cough is more or less hemoptysis, which gives a bright red expectoration. The sputum is often streaked with blood; on the other hand, it may be entirely free from blood. The plague bacilli are present in enormous numbers, frequently in pure culture. The absence of herpes in plague pneumonia is of a diagnostic importance. The pulse is usually very weak, and reaches, in these cases, 180 beats per minute, while the number of respirations may be as high as 75. More or less bronchitis is present, from the onset of the disease. The diagnosis of plague pneumonia may be difficult. This is due to the smallness of the areas of infected lung tissues. Within a very short space of time, however, these areas enlarge, when typical symptoms of pneumonia may be found. The spleen is always enormously enlarged in the pneumonic plague, and may be easily palpated. This is of a special importance in diagnosis. As the disease advances, septicæmia, carbuncles, and enlarged glands in various portions of the body may be found. The patient may infect the skin by means of scratching, giving rise to a primary bubo of the first order, with its usual train of symptoms. In plague pneumonia the glands at the base of the lungs would naturally be classed as primary buboes of the second order. Other enlarged glands would be secondary buboes, except in the event of a second infection, giving rise to a primary bubo of the first order. The infected lung may go on to necrosis and gangrene. The disease is usually fatal from the second to the fifth day; a few cases, however, have been known to recover.

To recapitulate: The chief points in the diagnosis of plague pneumonia are: Extreme prostration; high pulse; rapid respiration; characteristic sputum with plague bacilli; absence of herpes; enlarged spleen; physical changes in the thorax.

Secondary pneumonia in plague may be of the ordinary type, similar to that occurring in any infectious disease. In this class of pneumonia the sputum is not characteristic and never assumes the character of that seen in primary plague pneumonia.

The plague bacilli are always present. More or less blood is coughed up, which may or may not be intimately mixed with sputum. The pneumonia varies in degree from a light broncho to a lobar pneumonia. The usual physical signs are present, and need not be described. There may also be varying degrees of pleurisy. Secondary pneumonias usually occur at the height of the disease; that arising from emboli may occur at an earlier date. This complication is usually fatal.

Prognosis.—Prognosis naturally depends on the resistance of the individual, the location of the bubo, etc., the severity of the complications and especially on the virulence of the organism. During the course of the disease, but little can be said regarding the outcome, as any or all of the symptoms may change for the worse, without warning.

Generally speaking, the prognosis is unfavorable. The mortality, as has been noted, varies from 30 to 93 per cent.

Diagnosis.—During an epidemic the diagnosis usually offers no difficulty. The sudden onset, the rapid development of fever, and general extreme prostration are sufficient to establish the diagnosis. There is no disease in which prostration reaches such an extreme degree as in plague. When the above symptoms are associated with buboes, the nature of the disease is evident. In localities free from plague, and before and after an epidemic, the differential diagnosis may be difficult, or even impossible.

Light cases with buboes and slight general symptoms, with some fever, may be mistaken for what is called "climatic buboes." Climatic buboes usually occur in the groin, are painful and may go on to suppuration. Some fever is present. The attack is usually over within a week. The disease may be sporadic, or appear as a slight epidemic. The bubo and blood are bacteriologically negative. In plague cases, the glands are usually, and the blood may be, positive bacteriologically. The two diseases may be of equal severity.

In children, febrile adenitis must be considered. Febrile adenitis may be sporadic or epidemic. The disease occurs with some fever, which may reach 103° or 104°, and usually more or less cervical glandular swelling. Occasionally an axillary gland may be involved. The attack is usually light and lasts but a few days. The glands are negative bacteriologically. If the attack assumes a serious nature the disease may be at once differentiated from plague.

Light cases of plague may be confounded with venereal buboes. A thorough physical examination should make differentiation easy.

Severer attacks of plague, especially in the absence of buboes, must be differentiated from malaria, typhoid, and relapsing fevers. In these cases the general symptoms of the disease must be carefully considered. The sudden onset, conjunctivitis, reddened pharynx, rapid inspiration, etc., must be sought for. Blood examinations will usually give the surest diagnosis. In relapsing fever the blood examination is distinctive.

Dengue fever occurs with fever and glandular swellings. The pain about the joints and in the muscles associated with the exanthema and the favorable termination of the attack suffice to separate the two diseases.

Rubeola and numps, with glandular swelling and the absence of the other symptoms, may be confounded with plague. Here the microscope is of service.

Diphtheria with minor throat symptoms may simulate plague. Here the bacteriological examinations are most valuable.

In the absence of external glandular enlargements, with extensive involvement of the mesenteric glands, especially those about the cœcum or of the higher iliac glands, appendicitis must be considered. The general appearance of the patient, the vomiting, fever, leucocytosis, and localized pain about the lower right side may be misleading. Examination of the blood may or may not determine the nature of the disease. Increase of blood platelets may, in the absence of the organism, aid in the diagnosis; within a few hours the development of the bubo may solve the problem.

An isolated case of plague pneumonia may pass unnoticed, especially when of the bronchitic or broncho-pneumonic type. The sudden onset, with extreme prostration, the character of the sputum, and the finding of the bacilli serve to make the diagnosis. If these symptoms are not noticed the development of a bubo will facilitate the diagnostication.

Lesions of the skin in pest rarely offer any difficulty, as other positive symptoms are usually present. Malignant pustules must be considered.

In locations liable to plague, too much care can not be exercised. Considering the manifold manifestations of plague, and the importance of diagnosing the first case, one's suspicions should always be active. In the event of death an autopsy should by all means be performed, when the nature of the disease can usually be determined.

Treatment.—The treatment of plague naturally divides itself into sustaining and improving the general condition of the patient, and into reducing, as far as possible, the unfavorable action of the toxins and bacteria in the system.

Under the first division is included the symptomatic treatment, which naturally varies from time to time, and comprises the usual routine, such as cold baths, heart stimulants, and palliative treatment of the pain, etc.

The treatment of the bubo has been, and is, a much-disputed question. Many advocate the early removal of the affected gland, while others oppose this method. From the study of the pathology of plague, it appears that removal is, in most instances, of no practical benefit. Usually the deep glands of the infected chain are involved before the operation could be done, and would naturally serve as an uninterrupted source of infection. It would be practically impossible to remove the entire chain of glands. Ordinarily it is best to allow the glands to remain, and to open them when suppuration begins.

The skin lesions should be treated in the ordinary antiseptic way. All wounds should be carefully watched, as they may serve as sources of infection.

Results of experiments seem to show that smaller animals can be made immune to the disease, and that the serum prepared from immune animals has protective and curative properties when inoculated into other animals. Attempts to prepare antipest serum have, until very recently, been more or less unsuccessful. The serum was not of sufficient strength to be of any practical therapeutic use. Yersin's serum, obtained from the Marine Hospital corps, has been found useless here. Recently a small quantity of serum was obtained from Tokyo. With this, two out of three patients have recovered. In one case the bubo was not opened; in the second, they were, while the third case was too far advanced to offer any hopes of recovery. At present, the serum is too weak to admit of general use, as the necessary quantity could not be produced. Inoculation with small quantities gives a temporary immunity.

Protective inoculation, as practiced, is said to be of value. Sterile cultures are most commonly used. Local reaction and some fever usually occur, and may last three to six days. The protective power does not develop for six to eight days, and when developed is only temporary. Protective inoculations are not practical for the following reasons: Enormous plant necessary to produce the material; working force needed to inoculate the inhabitants; opposition of the people to the inoculation; temporary benefit derived. While statistics are favorable to protective inoculation, study of the epidemiological features of the disease throws considerable doubt on its real value.

OBSERVATIONS UPON DISEASES IN THE TROPICS, BY MAJ. CHARLES F. MASON, SURGEON, TWENTY-SIXTH UNITED STATES INFANTRY, VOLUNTEERS, JARO, PROVINCE OF ILOILO, P. I., NOVEMBER 15, 1900.

These remarks are based upon careful observation during about a year of service each in Porto Rico and Panay, P. I.

In the first place, as to acclimatization; if that term is intended to convey the idea that the constitutions of white men gradually adjust themselves to tropical conditions and thereby become better able to withstand disease, then I do not believe that there is any such thing as acclimatization. Men do gradually learn how to take better care of themselves, and to that extent are less liable to disease, but in my opinion the great majority of white men in the Tropics suffer a gradual deterioration of health, and year by year become less and less fit for active service.

In the second place, I am struck with the relative infrequency here of certain diseases common in Porto Rico, while certain other diseases often met with here were of rare occurrence there. This difference is shown in the following table:

Disease.	In Porto Rico.	In Panay.
Filariasis	Common among natives	Rare or absent.
Ankylostomiasis	do.	Do.
Chiggers	Common among soldiers	Do.
Syphilis	Common among natives and soldiers	Do.
Malarial fevers	Common among soldiers	Uncommon.
"X" fever	do.	Rare or absent.
Pyemia	Uncommon	Not rare among soldiers.
Beri-beri	Rare or absent	Common among natives.
"Y" fever	do.	Common among soldiers.

While I have not seen a case of syphilis originating here, other venereal diseases are abundant; in Porto Rico syphilis was a scourge.

This island had the reputation of being malarious, but I did not see a clearly defined case until the return of two of our companies from field service in Negros, when a large percentage of those organizations were affected with typical malarial intermittent and remittent. Unfortunately, I had no microscope, but the disease yielded promptly to quinine. Since a microscope has been available the only malarial organisms I have found have been in patients who have suffered severely with malarial fever in Cuba.

The fever which I call "X," as denoting my ignorance of its nature, I have not seen here, while it was very common in Porto Rico. It was evidently of a specific nature; began suddenly with chilly sensations, high fever, nausea, frequent vomiting, constipation, headache. After five days to a week the temperature fell to normal, with slow pulse, jaundice, and albuminuria. The patients appeared very sick, but always recovered.

"Y" fever, also an unknown quantity, occurred here epidemically at the end of the dry season. Like "X" it was evidently specific, beginning abruptly with chilly sensations, headache, rheumatic pains, and high fever. There was usually a sudden fall to normal in five to seven days, the drop in temperature being attended with profuse sweating and marked weakness. There was no eruption, no secondary fever, no jaundice. The patients all recovered, but slowly, and convalescence was often accompanied by obstinate neuralgias. This is the disease that was often diagnosed "dengue," but it frequently occurred in patients only recently recovered from the latter disease, and must not be confounded with it. True dengue also prevails here.

The pyæmia referred to is a very interesting condition, but though I have seen a number of cases they were all in hospitals not under my charge, and I can only briefly refer to it. Its distinguishing feature is its origin without apparent cause. The patient begins to lose health and strength and to have chills, fever, and sweating; then some limb or joint is observed to be swollen, and upon examination pus is found. The abscesses are nearly always large, deep seated, and unencircled; favorite sites are the groins, axillæ, and buttocks. One after another they are opened and drained, until the patient usually dies from exhaustion and septicæmia. Most of the cases have given a history of antecedent gonorrhæa, and in the absence of more obvious causes this possible source seems worth considering.

Dysentery and diarrhæa are about equally common in both islands, but there is a type of diarrhæa here which I did not see in Porto Rico. This form of disease closely resembles in symptoms the hill diarrhæa of Manson, but prevails at all levels. It occurs epidemically at the commencement of the rainy season, and is characterized by profuse, pale, watery, frothy stools with much flatulence and colic, the movements commencing after midnight, almost or entirely ceasing by noon. It appears to be dependent upon suspension of the functions of the liver and consequent flatulent indigestion, the result of overeating and chilling of the abdominal contents by cold drinks, exposure to cold in the early hours of the morning, and excessive dampness.

Dysentery prevails throughout the year, but there is a marked increase in the number and severity of the cases at the commencement of the rainy season and a progressive increase in both respects until a maximum is reached toward the end of August. It is by far the most serious disease which attacks the white soldiers in the Tropics both as regards its mortality and its invaliding effects. Out of 32 deaths from disease in the Twenty-sixth United States Volunteer Infantry during its first year of service in the Philippine Islands, 16 were from dysentery and its complications, and 10 more from typhoid fever.

Boils, abscesses, and leg ulcers are very common, the latter especially during campaign, when it is impossible to keep the underclothing clean. Though not dangerous to life, these seemingly trifling ailments put a large number of men out of service temporarily and correspondingly swell the sick report.

Suppurative inflammation of the middle ear with perforation of the drumhead is of frequent occurrence. It is insidious in its commencement, often deafness and sudden discharge of pus being the first symptoms noticed. Upon examination an acute catarrhal pharyngitis is usually found.

Another interesting condition is the prevalence of buboes, both in the groin and axilla, without discoverable point of origin. Frequently a careful examination of the tributary lymph district fails to reveal any lesion whatever; and this though the bubo may proceed to suppuration.

Smallpox, which is widely prevalent during the dry season, disappears almost completely during the rains. Possibly this may be explained by the greater freedom of communication in the dry season, or more probably by the active agency of dust as a carrier of infection.

BERI-BERI.

The only case of beri-beri in the person of a United States soldier was reported from Carranglan, Nueva Ecija, Luzon, by Contract Surgeon J. M. Ward. The patient, a colored soldier of Company G, Twentieth-fourth United States Infantry, was admitted into hospital June 16, 1900. For six months prior to admission he had been subject to occasional malarial attacks of no great severity or duration. On the day of his admission he had a severe chill, followed by the usual fever, but accompanied with unusual and excessive pain in the head, back, and lower limbs. Next morning the headache continued and he had much pain and stiffness, particularly in the right leg, in which the reflexes were abolished. The space limit for the sensation of two points varied from 4 to 6 inches at various points. Tickling the soles of the feet gave some response on the left side; none on the right. The loss of power in the right quadriceps extensor was so marked as to make locomotion practically impossible. The circumference of the right thigh measured 20 inches; bowels normal and urine free from sugar and albumen. Temperature 37.4° C. The history of this case is given in the following extracts from Dr. Ward's report:

June 20.—General condition unchanged. Loss of power in the extensor muscles so great that patient can hardly stand; locomotion entirely lost. He complains of great pain on slightest movement of lower extremities and numbness and tingling principally in right leg. Atrophy visible to the eye; thigh circumference 18 inches.

June 25.—Unchanged, except increasing loss of muscular power and decrease in pain and stiffness; thigh measurement 16½ inches.

June 30.—Seems much improved; appetite returning; sleeps well; bowels regular. Measured to-day 16 inches around thigh.

July 15.—For last two weeks great improvement. No pain on movement; can stand without crutch. Thigh measurement 15½ inches.

July 25.—Patient has steadily improved except for slight iodism one day. Walks to company kitchen for meals.

July 27.—Discharged to quarters. No sign of the morbid process remains except general weakness and some cardiac irritability.

On admission the usual antimalarial treatment was given, with a hypodermic injection of morphia. Afterwards the treatment was tonic with special diet; iodide of potassium, 10 grains, increased to 30 grains, three times a day, and strychnia sulphate by hypodermic injection in the quadriceps extensor twice daily; massage one hour every day.

Beri-beri has prevailed quite extensively among the Filipino prisoners of war. Special rations were provided for these cases and a marked improvement in their condition was recorded as a result. About 50 per cent of all sickness among prisoners is said to be due to this disease.

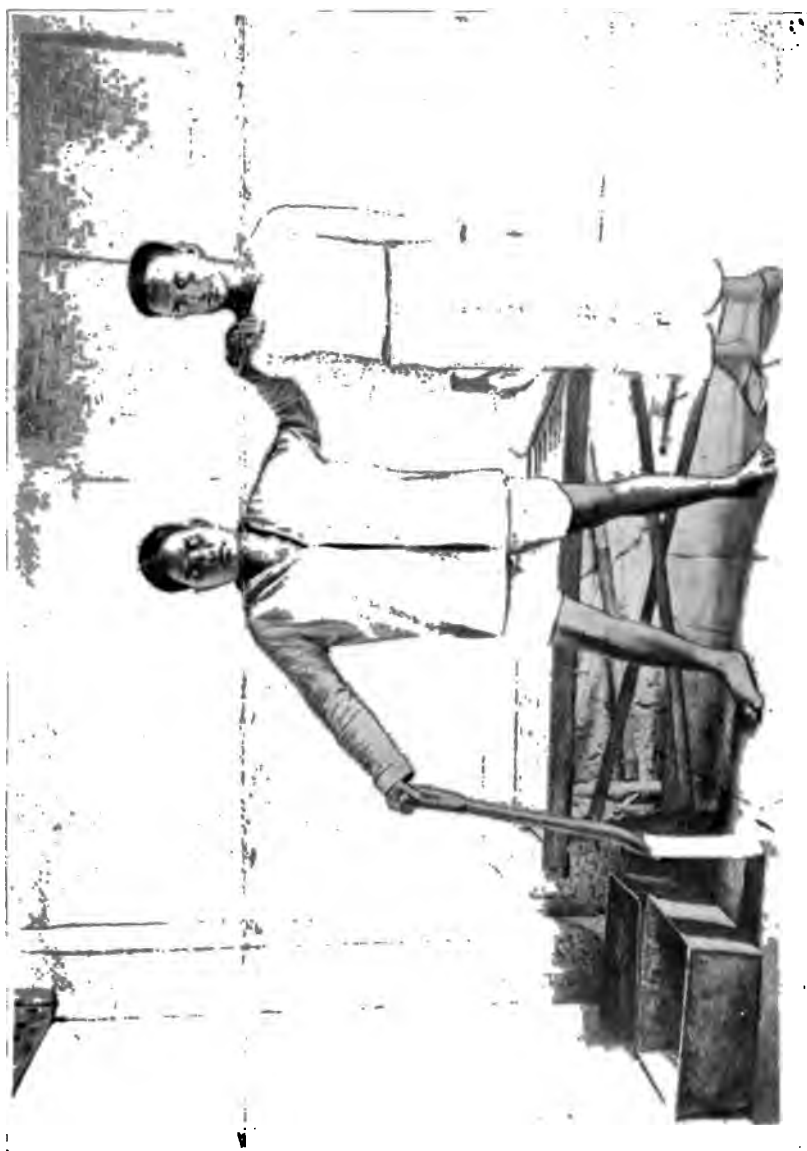
REPORT OF AN EPIDEMIC OF BERI-BERI AMONG NATIVE PRISONERS IN THE UNITED STATES MILITARY PRISON, LINGAYEN, PANGASINAN, P. I., BY CONTRACT SURGEON FRANK L. R. TETAMORE, JANUARY 31, 1901.

The hospital for native prisoners at the Carcel de Lingayen, P. I., is a large building with stone foundations and stone walls to the first floor. The ground floor is occupied as a general ward for the sick, except beri-beri patients. The floor above is used exclusively for beri-beri patients. There are two rooms; the large one, used as the general ward, is a light and airy room, with windows on all sides. Ventilation and sanitation are good. The small room is used for isolated cases. All the floors are wood. The sick sleep on bamboo bunks, with blankets and pillows; each one has a woolen blanket or bamboo mat. All food is cooked in the building and sufficient dishes are provided. One native acts as wardmaster, with four to assist as nurses. A native physician, with the assistance of a practicante, is employed to treat the sick under the supervision of the station surgeon. The service is now very sat-



No. 1.—WET BERT-BERT.





No. 2.—MIXED RERI-BERI.





NO. 3.—A, MIXED BERI-BERI; B, WET BERI-BERI; C, DRY BERI-BERI.





NO. 4.—THE POSITION TAKEN IN MIXED OR DRY BERI-BERI.



isfactory. An inspection of all buildings and grounds is made daily, and oftener if necessary. Complete records are kept.

The dispensary is well equipped with the necessary outfit and drugs, which are furnished on requisition from the civil funds.

The food is a great deal better than it was. If it were practicable to give the patients their native food it would be better, but I do not see how it can be done or how any improvement can now be made. The diet at first was mostly rice and salmon; it is now fresh beef, potatoes, tomatoes, beans, rice, salmon twice weekly, beef tea, hard bread, cream, coffee, and such vegetables as can be procured in the markets. The food is prepared by native cooks. It is a question if the food they were getting was the cause of the outbreak of beri-beri. My opinion is that the disease was caused by the bad sanitary conditions of the prison and grounds, together with the poor food, for since improvements have been made and the food changed there has been a gradual improvement in the health of the convicts, and while there has not been any case of beri-beri among the American prisoners, their general health has been better. In November there were at least five Americans in hospital daily, in January less than one on an average.

Beri-beri affects only the natives, and is the prevailing sickness. The epidemic started in the prison October, 1900. The following table shows the number of patients treated in the hospital since then:

	New cases.	Died.	Returned to duty.	Remain- ing sick.	Conva- lescent.
October, 1900.....	22	4	.....	18	.....
November, 1900.....	82	12	.....	38	.....
December, 1900.....	58	8	20	68	81
January, 1901.....	29	7	.....	90	45
Total.....	141	81	20	90	45
Time sick before death:					
Less than 1 month.....		5	.....	.....	.....
1 month.....		19	.....	.....	.....
2 months.....		7	.....	.....	.....
Time in prison before taken sick:					
Less than 1 month.....	3	.....	.....	.....	.....
1 month.....	11	.....	.....	.....	.....
2 months.....	13	.....	.....	.....	.....
3 months.....	17	.....	.....	.....	.....
4 months.....	16	.....	.....	.....	.....
5 months.....	22	.....	.....	.....	.....
6 months or longer.....	41	.....	.....	.....	.....

This statement shows but 20 returned to duty. Many of those remaining as convalescent are comparatively well, but are kept in hospital until the improvements being made in the prison are finished. It requires at least three months for patients to recover fully. This disease has been classified by some writers as wet, mixed, and dry. This is a good classification and easily understood, as the terms clearly indicate the different conditions. The line can not be distinctly drawn between the wet and mixed. As I have seen it here in all its stages and tried to observe very carefully, I can not concur with the statement made by many that it is a multiple neuritis. I have made seven autopsies, finding the same effusion in the pericardial and pleural cavities, the pericardial sac in each case completely filled with fluid. (Specimens of these autopsies have been sent to the laboratory of the Army at Manila for examination.)

The fluid found in the cavities is the same in the wet as in the dry. The following photographs taken by myself show the different forms: No. 1. Wet beri-beri, under treatment in the hospital one month. The legs are cedematous and the face and neck much swollen, looking like mumps. In this case there is not, nor has been, any paraplegia; the first symptom was a numbness in both legs, no chill nor pain. There was no pitting on pressure, except along the sides of the crest of the tibia. The patient died suddenly five weeks after entering the hospital. The pericardial, pleural, and peritoneal cavities were filled with fluid of an amber color. No. 2. Mixed beri-beri. There is some cedema, not extensive, in both legs and not above the knees; the face and neck are swollen; there is almost complete paraplegia, the patient having been unable to walk for more than a month. Recovery in three months. This photograph was taken after he was in the hospital one month. No. 3. A. Shows mixed beri-beri with symptoms as in No. 2, except that the paraplegia was partial; his gait was as shown in the photograph. B. Wet beri-beri. This was the most severe case, with extensive cedema; the legs and thighs were swollen, also neck and face; there was no para-

plegia; his first symptoms were numbness in both legs, aching pain in the calves, and complete anesthesia along both sides of the crest of the tibia so that a deep needle puncture was not felt. After the first few days the aching pain subsided, giving place to a pain in the same parts only when getting up or suddenly changing a position, but not while walking. Appetite good; bowels regular or somewhat constipated; no fever, the temperature usually subnormal. Pain over the heart and dyspnea very severe during the week before death. C. Dry beri-beri. No oedema, but complete paraplegia; general conditions atrophic. The paralysis was gradual, the patient becoming completely helpless during the third week. There was no numbness above the hips nor swelling of the face or neck; no chill nor fever. The disease was at its height during the eighth week, after which gradual recovery took place. No. 4 shows the position taken by a mixed or dry case. There is always a partial or complete paraplegia in the dry cases, in the mixed generally partial, and the wet seldom any. I saw 14 cases of dry beri-beri at Bigon, province of Bulacan, all ages and sexes, all in one building; complete paraplegia in 10, partial in 4, with oedema in none; all recovered in three months. General symptoms: Weakness in both legs, aching dull pain in the calves (but no acute boring pain as in multiple neuritis). Numbness in the legs only; slight pitting on pressure on both sides and along the crest of the tibia and complete or partial anesthesia here only. The first symptoms of all forms are about the same—there is no chill or fever, no gastric or intestinal disturbances or loss of appetite. After the first week the oedema in the wet will appear; in the mixed, oedema and loss of power in the legs; in the dry, an atrophic paralysis. About the fourteenth day the neck and face swell in the wet and mixed. There are no other special symptoms except the subnormal temperature of the body and in some cases constipation.

The following table shows the temperature of 10 patients for 10 days; the first 3 are mixed, 4 wet, and the remainder dry beri-beri:

Temperature, centigrade, taken every morning.

Day.	First.	Second.	Third.	Fourth.	Fifth.	Sixth.	Seventh.	Eighth.	Ninth.	Tenth.
1	36.2	36.5	36.3	36.2	36	35.7	36	36.5	36.5	35.8
2	35.4	36	36.2	36.8	35.6	36	36.5	35.8	36.1	36.2
3	35.8	35.3	36.4	36.4	36.2	36	35.9	36.1	35.8	36
4	35.5	36	35.8	35.9	35.7	35.6	36	36.4	35.1	35.8
5	36.5	36.7	35.1	35.3	36.1	37	36	35.9	36	36.2
6	35.8	36.5	36	36.7	36.3	37	36.2	37	36.7	37.1
7	36.2	37.5	36.7	36.7	37.5	37.5	37.8	37.1	36.2	35.4
8	36	35.5	35.4	35.7	36	36.2	36.1	36.6	36	35.4
9	37.2	36.8	36.2	36	35.6	36	35.8	36.5	35.5	36.3
10	36.3	35	35.4	35.2	35.4	35.7	36.7	36	36.1	35.9

While there is no chill, the patient suffers from cold at night with the temperature of the atmosphere from 26.7 to 30° C. The swelling of the face and neck causes no pain in mastication. Many physicians diagnose this as mumps. The oedema in the legs and feet is never as extensive in the mixed beri-beri as in the wet; in the mixed there is partial paraplegia about the fourteenth day. I have not seen complete paraplegia in this variety. In the wet variety there is seldom any paralysis; there is severe pain over the heart with dyspnea after the third week in these two varieties.

The wet cases are the most dangerous; during the fourth week the pain is very severe, the tongue is heavily coated, brown in the center, and pale on the edges. In these severe cases there is usually nausea and vomiting at this stage, followed by acute gastric pain; seldom any diarrhea. About the thirtieth day these patients will not remain on their bunks, but lie on the floor rolling around in their endeavor to breathe. The death is very painful and in many cases sudden. You will find patients, whom you think convalescent at night, dead in the morning.

The symptoms of the dry cases are about the same as those of the others. Anesthesia along the crest of the tibia, weakness of the legs, and aching in the calves. Their general condition becomes atrophic; complete or partial paraplegia; slight pain over the heart about the twentieth day; no fever; temperature subnormal. These patients generally recover. All the difficult cases have a neurotic dermatitis on both lower extremities extending to the abdomen. The blood is watery. I made special examination of the blood of 35 different patients, the results being negative, except in a few cases. Eight culture tubes were prepared with gelatine meat as a medium for fresh blood from as many patients. In the eighth tube I succeeded in growing micrococci in pairs and irregular groups. The cell was about one-fourth the size of a red blood corpuscle. These cocci were also found in the white cells, which were in excess. Of the 35 cases, 4 showed these micrococci; they were stained with gentian violet. In the blood from the cadaver the same germ was found.

The urine of 10 cases was specially examined, 5 wet, 2 mixed, and 3 dry. The quantity was normal; color, pale amber; reaction, slightly acid. Albumen, 5 per cent in 2 specimens only; sugar, none; excess phosphates in 1; excess phosphates with bile in 1; no deposit in other specimens. In 3 cases micrococci were found in pairs and irregular groups like those observed in the blood. The stain was gentian violet.

It is impossible from my observation to fix any period of incubation. You will see by the table that most of the patients had been in the prison several months. The largest number had been exposed to the same conditions the longest time and among these were the greatest number of deaths.

Of the prisoners sent away for work, some developed the disease over one month after they left. Of 7 who were employed excavating the earth from one of the rooms, 5 were taken sick with the disease in less than one week. This might indicate that the germs were in the soil, and that these men were brought under the direct influence; in these cases the period of incubation might have been only a few days.

I have made seven autopsies, as follows:

Case 1.—Wet beri-beri; sick one month; died suddenly from syncope. Maculæ and ulcers on the lower extremities and abdomen; œdema of both legs, extending to thighs. Abdomen distended with fluid; swelling of both sides of face and neck. The tissues were filled with fluid blood. Lungs normal, with no adhesions; pleural cavity partially filled with fluid. Pericardial sac was distended with fluid; heart enlarged; walls thin; both sides filled with blood; no clots. Aorta also filled with blood. Liver enlarged and congested. Kidneys normal, with no congestion. Spleen normal. Cerebral cavity filled with fluid; brain congested.

Case 2.—Wet beri-beri; died suddenly. General œdema. Maculæ and ulcers on both legs and abdomen. This patient was brought to the post guardhouse as a witness, and it was not known that he was sick. He was taken with severe dyspnea and cardiac pain, and died in four hours. The abdomen was distended with fluid; the tissues were congested; but there was very little blood in the large vessels. The pericardial sac was distended with fluid; heart enlarged and filled with liquid blood; no clots; walls thin. There were peculiar white spots on the surface of the heart. Left lung normal; right lung adherent and with tubercles in many parts; spleen enlarged to at least one-half its normal size; liver enlarged, adherent, and congested; kidneys normal. Spinal canal filled with fluid.

Case 3.—Mixed beri-beri. Some œdema of lower extremities; maculæ and ulcers of both legs and abdomen. There had been complete paraplegia. Tissues and vessels filled with fluid blood. Pericardial sac filled with fluid; heart filled with blood both sides; walls thin; no clots; aorta and venæ-cavæ filled with fluid blood. Left lung normal; right slightly adherent; very little fluid in pleural cavity. Spleen enlarged to three times its normal size. The cerebral cavity contained a large quantity of fluid; brain congested; calcareous deposits on dura mater.

Case 4.—Mixed beri-beri. General appearance as in the other cases. General congestion; heart filled with fluid blood; very little fluid in sac; no clots; left lung normal; right lung adherent and in second stage of pneumonia; the whole lung involved.

Case 5.—Wet beri-beri. Complete rigor mortis. (This is the only case in which there was any rigor mortis eight hours after death.) Edema extensive, chiefly in lower extremities, abdomen, and face. Tissues and vessels filled with fluid blood; pericardial sac distended with fluid; heart enlarged; right side filled with fibrinous clots; left side, fluid blood only; left lung adherent, upper lobe congested; right lung in second stage of pneumonia, whole lung involved; intestines congested. Spleen enlarged to twice its normal size; liver enlarged and congested. There was partial paraplegia four weeks before death.

Case 6.—Six hours after death. Dry beri-beri. Emaciated. Vessels and tissues congested. Heart enlarged; very little fluid in the sac; both auricles contained large fibrinous clots; none in ventricles, which were filled with fluid blood. Lungs normal, no adhesions or congestions; spleen enlarged to four times its normal size; kidneys normal. Cerebral cavity contained but little fluid; brain and spinal cord congested. This patient had partial paraplegia at least two weeks before he died.

Case 7.—Dry beri-beri. Sick five weeks; partial paraplegia; no œdema. All vessels filled with fluid blood. Large quantity of fluid in pleural cavity; right lung, normal; left lung, adherent, lower and middle lobes in third stage of pneumonia; tissues breaking down and filled with exudate; pericardial sac filled with fluid; right side of heart filled with fibrinous clots, left side with fluid blood.

It will be seen that in all these cases the pericardial sac was distended with fluid, and the vessels filled with fluid blood.

Specimens of all the organs and of the spinal cord have been sent to the laboratory of the army for examination.

LEPROSY.

Occasionally references are found in inspection reports to the prevalence of leprosy among the natives in the vicinity of garrisoned posts. The following is from a report on the military hospital at Cebu, P. I., by Maj. L. M. Maus, sanitary inspector of the Division of the Philippines, dated July 17, 1900:

Leprosy is a common disease among the inhabitants of this island, and many cases are found scattered along the seashore in the various pueblos. The town of Cebu contains an old leprosy hospital which was established in 1852, and is capable of caring for about 100 cases. This institution is located about one-half mile outside of the town, along the seashore. I found numerous cases of leprosy along the roadside during my visit to this lazaretto, among whom were many children, generally engaged in begging. I understand that the city ordinances do not permit lepers to enter the city, and that a deadline has been established at a certain point. The leprosy hospital was formerly allowed \$1,842 annually by the Spanish Government, the deficit being made up by the friars who had charge of the institution. The hospital contains about 80 people, equally divided among the two sexes. Many of the patients are children from 8 to 14 years old. The disease appears mostly in the tuberculous form, many nodules appearing on the face and lobes of the ears. In many instances the nose had sunk. Quite a large percentage of the feet were affected, and in a number of cases the toes had gone. Beyond shelter and spare food nothing is done for these unfortunates. Colonel McClelland has constructed a large nipa barrack near the hospital, about 250 feet long and 20 feet wide, around which he intends to construct a barricade. After the completion of this he intends to segregate and take care of all the lepers in the town and its immediate environment. He has allowed 6,000 pesos annually for the support of these people, which he turns over to the priest who has charge of this work. I understand that there are between 200 and 300 lepers in Cebu and its suburbs. The work Colonel McClelland is performing is praiseworthy, but much better results could be obtained were the entire matter turned over to the medical department.

A plan for the segregation and care of the lepers of the Philippine Islands was submitted June 4, 1900, by the chief surgeon to the military governor. This met with the approval of the latter, and on June 18 an order was issued convening a board of officers to select an island suitable for the purpose and to formulate working plans for the establishment of a leper colony, including estimates for suitable buildings, for the salaries of the necessary officials and employees, and for the rations and other allowances for the support of the establishment. The board consisted of Maj. Louis M. Maus, surgeon, United States Army, Capt. George P. Ahern, Ninth United States Infantry, and Capt. W. E. Horton, assistant quartermaster, United States Volunteers.

Pursuant to instructions from the military governor, the board embarked on the U. S. gunboat *General Alava* for the purpose of visiting the islands previously selected for investigation and designated by the military governor in a letter to the admiral commanding the fleet. The islands thus designated were Lubang, Ylin, Maestro de Campo, Bantayan, Camotes, and Linapacan, all of which were visited and investigated except the last, which was stricken from the list by the naval commander, as it lay outside of the route the vessel was expected to take in the delivery of stores to the naval vessels in southern waters. The following are the conclusions submitted by the board on the completion of this voyage of inspection:

In consideration of the large number of lepers reported in the archipelago (about 30,000), and the various racial elements represented, the board fully appreciates the difficulties in the selection of a single island for this colony. Besides its agricultural advantages, fertility of soil, variety of products, etc., an island suitable must possess a sufficient area to maintain a population of probably 40,000 people, for undoubtedly a large number of families of these unfortunates will follow them into voluntary

exile. It should also be capable of varied products such as rice, corn, potatoes, tobacco, hemp, garden vegetables, and the different fruits. An island whose main product is rice would hardly be suitable, when we consider the hard labor entailed in its culture and the character of the colonists, most of whom being weaklings. So far the board has found no suitable single island, except one containing a large or fairly large population, the compulsory removal of which might be questionable. The islands of Ylin, Maestro de Campo, and Bantayan are considered unsuitable for the following reasons: Ylin, on account of its physical features and lack of agricultural lands; Maestro de Campo, its inferior size; and Bantayan, its large population (about 20,000). Sibuyan is quite large and populous, and generally speaking is covered with mountains and forests, and contains only a small amount of agricultural land, which is well settled. While we only examined one side of the island, we do not regard it as suitable. The Camotes group, however, appear to possess all the necessary requirements for the establishment of a self-supporting colony, such as size, fertility of soil, variety of products, location, isolation, water, timber, and healthfulness. Two of these islands, Pa'ayan and Porro, will in all probability meet all the requirements of the colony for the next twenty-four years and be able to maintain a population of 30,000. The population of these two islands has been estimated as 13,000 people. While Lubang possesses a number of advantages—location, size, products, etc.—the board does not feel justified in coming to definite conclusions in regard to its suitability without further investigation, but it is believed capable of supporting a population of 20,000 were the resources of the island developed. General Kobbe, of the Army, and Captain Bleeker, of the Navy, highly recommend the island of Cagayan de Sulu (Jolo) for the colony. This island is situated on the extreme southwestern portion of the archipelago, north of Borneo; is about 6 miles in length and width; contains about 2,000 Moros; is said to be fertile, cool, healthy, and otherwise suitable. The bishop of Cebu very strongly recommends the island of Sikujor, a large island lying north of Mindanao, but it is said to contain a population of 40,000 people. Professor Worcester speaks very highly of the Kalamianes group, which lies on the twelfth parallel, about 50 miles southwest of Mindoro. This group contains the islands of Busuanga and Caleon, besides a number of small islets. Professor Worcester, who has visited them several times, informed us that they were fertile, healthy, and very sparsely inhabited. The board would have visited them during the trip had it not been contrary to orders received by the commanding officer of the ship. In conclusion, the board deems it best that its final action in regard to selection be deferred until the Kalamianes group and the islands of Cagayan de Sulu be examined and Lubang more fully investigated. Should the removal of the population of the island of Sikujor be not considered objectionable, it also recommends that it be included in the list for examination.

The subject was again taken up on January 3, 1901, by the issuance of an order from the office of the military governor directing the board to inspect the islands of Culion, Busuanga, and Cagayan de Jolo, and to make such further examination of the island of Tubang as might be deemed necessary. The board was called upon on its return to Manila to report not only on a suitable site for a leper colony, but on the relative advantages of each of the islands visited for the establishment of a penal colony. Transportation having been provided by the gunboat *General Alava*, the board made its second voyage of inspection, and on its return to Manila submitted a full report, the conclusion and recommendations of which were as follows:

Including those examined on a previous visit of the board, July 5 to 24, 1900, the following islands so far have been inspected and considered: Bantayan, Busuanga, Cagayan de Jolo, Campo de Maestro, Culion, Comotes, Cuyo, Ylin, Linapacan, Lubang, and Sibuyan. All of these islands have been visited once by the board and examined with more or less care, Lubang having been visited twice. In consideration, however, of the brief period allotted the board, less than one month for both visits, it will be readily understood that but little time could be devoted to the close inspection of each island. After having carefully considered the special or superior advantages of each island inspected for the purpose of establishing a colony for lepers the board unanimously recommends Cagayan de Jolo. This island is believed to possess all the qualifications required—size, fertility of soil, variety of products, healthfulness, and geographical location. Its unique position in the archipelago and distance from other islands peculiarly fit it for this purpose. Besides, its selection would

disturb few people and practically involve no property interests, since the population consists only of a few hundred semicivilized Moros, who apparently claim nothing more than the sites upon which their huts are located. If the selection of this island as a colony for the segregation of the lepers of the archipelago meets with the approval of the governing authorities, the board recommends that immediate steps be taken to place it in condition for their reception. It is believed that the appropriation of \$25,000 Mexican currency would be sufficient to place the island in a suitable condition for the reception of lepers now confined in the various lazarettos on the island. The present occupants should be removed to Palawan, or the Jolo group, which it is believed could be done with little expense. It is not regarded advisable at present to submit estimates for the erection of permanent buildings or the construction of roads, wharves, water system, and other expensive improvements. The huts now occupied by the natives could be utilized by the less serious cases, while the nipa barrack should be constructed for those requiring constant care. In addition to the barrack or hospital a few buildings should be erected for the use of the superintendent, physicians, druggist, school-teachers, foremen, padre, and employees, and a large godown for supplies and stores, these buildings to be constructed of material similar to that used in the buildings now on the island. It is believed that 1 superintendent, 2 native physicians, 1 school-teacher, 2 foremen, and 25 laborers, including carpenters, would be sufficient to start the colony.

The suitability of the various islands examined, for the establishment of a penal colony, depends on the rules instituted for its government. Should it be intended simply as a place for isolation and detention, in penitentiaries and stockades, in all probability the island of Penon de Coron would be most suitable.

On the other hand, should it be intended to establish a colony where the labor of the convicts could be utilized in chaingangs for the cultivation of the soil, felling timber, building of roads, etc., it is believed that Busuanga would prove best adapted.

On account of its isolation and fertility Cagayan de Jolo is also admirably suited for this colony, but would serve a better purpose for the segregation of the lepers.

On account of Cuyo's large population and Linapacan's physical features, these islands can not be considered. Culion is rich, fertile, and would be well adapted, provided the colony was limited in number. The establishment of the colony on Lubang would in all probability entail the expenditure of large sums to pay for property owned by the church and private individuals and for the removal of the present population, unless it was intended to construct penitentiaries there for the confinement and isolation of the convicts.

On account of the favor with which the island of Cagayan de Jolo was regarded by the board, the following from the report on this island is submitted:

This beautiful little island lies in 7° N. latitude and 118° 30' E. longitude, is about 8 miles long from east to west and 5 miles broad from north to south. Except for a few small islets, Cagayan de Jolo occupies a very isolated position, lying as it does in the center of the Mindoro Sea, almost midway between Palawan on the west and the Sulu group on the east. It is about 75 miles north and east of Borneo. The surface of the island, generally speaking, consists of gently undulating plains, covered with a heavy growth of cojon, with here and there a large tree or a small grove of coconut trees, which add immensely to the picturesqueness of the landscape. To the west and south the terrain gradually ascends to elevations which might be designated as mountains, though it is a question whether any point rises higher than 1,000 feet above the sea level. The soil appears rich, is reddish in color, and contains loam, clay, and sand. Although very little in the way of agricultural development has taken place, it is believed that the island is highly susceptible of cultivation, and that almost everything grown elsewhere in the archipelago can be raised here—coconuts, bananas, oranges, cajeles, corn, sweet potatoes, gabe, cocoa, rice, sugar cane, hemp, cotton, and all kinds of garden vegetables. Coconut trees were observed growing luxuriantly on the highest ranges of hills. There were evidences of sugar plantations long since overgrown with rank growth of cojon. The inhabitants consist of about two or three hundred uncivilized Moros, who live in thatched huts in the most primitive way. They cultivate very little ground, and appear to subsist principally on fruits, roots, fish, and mollusks. Their houses are small, low, and generally consist of one apartment, which contains very little in the way of furniture or household articles, and are very dirty. An occasional cow or carabao and a few chickens were noted on the island. We met a few of the natives, but as they were unable to speak any language that was intelligible to any member of our party, which included Spanish, Tagalo, and Visayan, we were unable to communicate with them. They are lazy, indolent, and semicivilized, and should be placed very low in the scale of humanity. It is questionable whether a single inhabitant of the island can read or

write. All the males were armed with well-kept and sharpened boronga and lances, from which they could not be induced to part for any money consideration. As far as we were able to learn no running streams were found to exist in the island, certainly none on the plains, though there may be some in the mountain districts. The drinking water is procured from wells. A spring has been reported by sailing masters to exist on the south and west shore of the island. The craters of two large and extinct volcanoes exist on the southern shore, the other being perfectly landlocked, though equally filled with water, which appears to be on a level with the sea. Both of these lakes are very deep, and the interior one is said to contain fresh water.

There appears to be no good harbor in the island, and the shore is surrounded by a coral reef, which extends out from one-half to 1 mile, except on the northwest and southeast coast. Good anchorage for ordinary commercial vessels can be obtained within 500 yards off the south shore near the two volcanic lakes. The best anchorage during the northeast monsoon is on the west side of the island, where an anchorage can be obtained in 9 or 10 fathoms.

INJURIES.

The admission, discharge, and death rates from injuries in the Army as a whole in 1900 were, respectively, 196.27, 4.89, and 6.95 per thousand of the strength, as compared with 192.47, 4.47, and 6.67 in 1899, and 232.75, 3.10, and 2.74, the mean annual rates of the decade 1889-1898. The troops in China, Cuba, and the United States had larger admission rates than the rate of the Army as a whole; those in the Philippines and Porto Rico had smaller rates. The discharge rate and death rate in China were unusually high, as also was the death rate among the volunteers in the Pacific Islands.

Table showing the number of admissions, discharges, and deaths caused by the prominent classes of injury, with the ratios per thousand of strength, among the troops serving in the United States and among those on insular or foreign service, year 1900.

Place of service and causes of admission.	Admissions.		Discharges.		Deaths.	
	Number.	Ratio.	Number.	Ratio.	Number.	Ratio.
Army:						
Contusions and sprains.....	7,572	75.42	4	0.04	.....	.....
Abrasions, blisters, burns, and scalds.....	2,515	25.05	.....	.....	1	0.01
Wounds, contused, lacerated, and punctured.....	2,352	23.43	6	.06	5	.05
Wounds, gunshot.....	1,173	11.69	235	2.34	471	4.69
Total injuries.....	19,703	196.27	491	4.89	698	6.95
United States:						
Contusions and sprains.....	2,761	133.43	2	.10	.....	.....
Wounds, contused, lacerated, and punctured.....	777	37.55	3	.14	2	.10
Total injuries.....	5,547	268.10	140	6.77	61	2.95
Cuba:						
Contusions and sprains.....	1,249	143.72	1	.12	.....	.....
Wounds, contused, lacerated, and punctured.....	366	42.12	1	.12	.....	.....
Wounds, gunshot.....	29	3.34	5	.58	3	.35
Total injuries.....	2,493	286.88	29	3.34	12	1.38
Porto Rico:						
Contusions and sprains.....	24	11.01	.....	.....	.....	.....
Wounds, contused, lacerated, and punctured.....	42	19.27	.....	.....	.....	.....
Wounds, gunshot.....	12	5.50	1	.46	.....	.....
Total injuries.....	398	180.27	3	1.38	.....	.....
China:						
Contusions and sprains.....	100	51.36	.....	.....	.....	.....
Exhaustion from exposure and fatigue.....	97	49.82	.....	.....	1	.51
Wounds, gunshot.....	182	93.47	38	19.52	42	21.57
Total injuries.....	627	322.03	40	20.54	47	24.14
Pacific Islands (volunteers):						
Contusions and sprains.....	1,440	45.81	1	.03	.....	.....
Abrasions, blisters, burns, and scalds.....	990	31.50	.....	.....	.....	.....
Wounds, gunshot.....	609	19.37	50	1.59	255	8.11
Total injuries.....	5,288	168.23	87	2.77	354	11.26
Pacific Islands (regulars):						
Contusions and sprains.....	1,811	51.09	.....	.....	.....	.....
Abrasions, blisters, burns, and scalds.....	760	21.44	.....	.....	1	.03
Wounds, gunshot.....	284	8.01	119	3.86	150	4.32
Total injuries.....	5,355	151.06	192	5.42	214	6.04

RADICAL CURE OF HERNIA.

The following operations for the radical cure of hernia were performed or reported during the year ending June 30, 1901:

Name.	Organization.	Age.	Hernia.	Date of operation.	Operator.
A. E.	Pvt., D, 5th Inf.	22	Right inguinal	June 29, 1900	W. H. Block, contract surgeon, U. S. A.
H. J. Y.	Elect. Sergt.	25	Left inguinal	July 18, 1900	
P. P. F.	Pvt., B, 4th Art.	24	Right inguinal	July 23, 1900	
J. F. L.	Civilian	36	Left inguinal	Sept. 11, 1900	
C. A. L. ¹	Pvt., Hosp. Corps	21	Right inguinal	Sept. 18, 1900	
F. D.	Pvt., O, 4th Art.	37	Left inguinal	Sept. 25, 1900	
J. C. C.	Pvt., D, 7th Art.	21	Double inguinal	Oct. 5, 1900	
W. F. S.	Rec't., unassigned	22	Right inguinal	Oct. 19, 1900	
G. P. M.	Civilian	21	Double inguinal	Oct. 23, 1900	Maj. W. C. Borden, surgeon, U. S. A.
A. H.	Pvt., F, 2d Art.	24	do	Oct. 26, 1900	
G. W. B.	Serg't., F, 7th Art.	29	Right inguinal	Nov. 9, 1900	
G. J. N.	Capt. Med. Dept.	36	Double inguinal	Nov. 23, 1900	
A. S. B.	Serg't., K, 4th Art.	25	Left inguinal	Dec. 21, 1900	
W. F. S. L.	Pvt., D, 19th Inf.	31	do	Dec. 28, 1900	
J. H. G.	Pvt., D, 7th Art.	22	Right inguinal	Jan. 25, 1901	
R. P.	Pvt., 37th Co. C. Art.	47	Left inguinal	Feb. 22, 1901	
F. G.	Pvt., A, 8th Inf.	22	Right inguinal	Nov. 11, 1900	
E. K. J.	Pvt., Hosp. Corps	31	Ventral	Dec. 4, 1900	Capt. A. E. Bradley, assistant surgeon, U. S. A.
W. J. McC.	Pvt., F, 1st Cav.	47	Left inguinal	Jan. 14, 1901	
J. L. O'C.	Pvt., I, 10th Inf.	25	Right inguinal	Sept. 7, 1900	
G. H.	Pvt., I, 10th Cav.		do	Oct. 25, 1900	Maj. L. C. Carr, surgeon, U. S. V.
C. B.	Pvt., C, 45th Vol. Inf.	24	Left inguinal	Jan. 29, 1901	First Lieut. C. B. Darnall, assistant surgeon, U. S. A.
A. B. B.	Corpl., F, 31st Vol. Inf.	23	Right inguinal	Feb. 11, 1901	
C. M. T.	Pvt., H, 31st Vol. Inf.	30	do	do	
H. H.	Pvt., B, 5th Cav.	29	Double inguinal	Sept. 10, 1900	Capt. C. E. B. Flagg, assistant surgeon, U. S. A.
J. F. S.	Serg't., A, 2d Inf't.		Ventral	do	Capt. E. B. Frick, assistant surgeon, U. S. A.
R. B. ¹	Pvt., B, 16th Inf.		Right inguinal	July 28, 1900	
F. C.	Pvt., C, 18th Inf.		Left inguinal	Aug. 6, 1900	
A. A. C.	Pvt., Hosp. Corps		Right inguinal	Aug. 18, 1900	
J. G.	Pvt., A, 18th Inf.		do	July 26, 1900	
G. G.	Civilian		Left inguinal	Aug. 16, 1900	
J. A. J.	Serg't., A, 35th V. I.		Right inguinal	Aug. 8, 1900	
R. G. L.	Pvt., A, 4th Cav.		Left inguinal	Aug. 1, 1900	
C. C. P.	Act. hosp. steward		Double inguinal	Aug. 21, 1900	
R. R.	Pvt., K, 35th V. I.		Right inguinal	Aug. 16, 1900	
R. B. S.	Civilian		Left inguinal	July 28, 1900	
G. W. S.	Pvt., F, 33d V. I.		do	Aug. 9, 1900	
O. S.	Pvt., M, 7th Inf.		Right inguinal	Aug. 22, 1900	
E. A.	Mus., A, 18th Inf.		Left inguinal	Nov. 12, 1900	
J. A. G.	Pvt., H, 27th V. I.		do	Oct. 21, 1900	
H. R. G.	Pvt., H, 6th Art.		Ventral	Oct. 17, 1900	Lieut. Col. A. C. Girard, deputy surgeon-general, U. S. A.
C. H.	Pvt., I, 35th V. I.		Right inguinal	Oct. 2, 1900	
R. LaP.	Pvt., Hosp. Corps		do	Oct. 3, 1900	
R. W. P.	Corpl., M, 9th Cav.		do	Sept. 19, 1900	
G. S.	Civilian	11	do	Oct. 21, 1900	
C. E. S.	Pvt., M, 19th Inf.		do	Sept. 17, 1900	
F. M.	Pvt., M, 29th V. I.		Ventral	Feb. 13, 1901	
J. T.	Discharged soldier		Double inguinal	Jan. 8, 1901	
R. R. A.	Pvt., Bd., 32d V. I.		Left inguinal	Feb. 9, 1901	
G. A.	Discharged soldier		Right inguinal	Dec. 27, 1900	
Z. W.	Pvt., H, 29th V. I.		do	Feb. 7, 1901	
T. S.	Discharged soldier		Ventral	Jan. 9, 1901	
J. L.	Pvt., A, 21st Inf.		Left inguinal	Dec. 12, 1900	
F. D.	Discharged soldier		do	Dec. 19, 1900	
J. G.	Pvt., L, 4th Cav.		do	Dec. 6, 1900	
C. B.	Discharged soldier		Ventral	Feb. 23, 1901	
C. F.	do		Right inguinal	Feb. 12, 1901	
S. W.	Civilian		Left inguinal	Mar. 1, 1901	
G. C.	Pvt., E, 5th Art.	37	Right femoral	Jan. 30, 1901	Capt. D. C. Howard, assistant surgeon, U. S. A.
F. A. K. ¹	do	27	Right inguinal	Feb. 15, 1901	
J. W. Van N.	Pvt., K, 1st Art.		Left inguinal	Dec. 18, 1900	J. S. Kennedy, contract surgeon, U. S. A.
B. D. J.	Pvt., A, 10th Cav.	29	Right inguinal	Feb. 22, 1901	First Lieut. Ira M. Shimer, assistant surgeon, U. S. A.
W. B.	Corpl., D, 7th Cav.	22	do	Dec. 4, 1900	Capt. A. N. Stark, assistant surgeon, U. S. A.
G. A. J.	Pvt., H, 2d Art.		do	Jan. 26, 1901	
C. L.	Pvt., E, 2d Cav.	23	Ventral	Sept. 20, 1900	First Lieut. J. Hamilton Stone, assistant surgeon, U. S. A.
J. B.	Civilian	12	Double inguinal	Jan. 9, 1901	
P. F.	Pvt., I, 2d Cav.	22	Left inguinal	Aug. 7, 1900	

¹ Recurrence of hernia.

In September, 1895, after fully considering the results attained by surgical treatment in the radical cure of hernia, together with the small amount of risk involved in the operation as now conducted under careful aseptic supervision, I came to the conclusion that the operation might be made available to preserve good soldiers, although ruptured, in the service, and to lessen the number of men discharged for disability and then pensioned for hernia. The annual loss of men by rupture has always been considerable. During the six calendar years ending December 31, 1894, 153 men were discharged. I did not consider that the progress of surgery warranted a resort to operative proceedings in all cases, but felt confident that surgical interference would enable many to continue in the military service or earn their livelihood with comfort in civil life who are now discharged and pensioned for hernia. Accordingly, on September 9, 1895, the following was published from Headquarters of the Army, Adjutant-General's Office, as Paragraph II of Circular No. 9, of that date:

II. Treatment of enlisted men who have been ruptured in the line of duty.

Cases of hernia suitable for an operation should receive surgical treatment, which, by the most approved modern methods, is successful in a large proportion of the cases operated upon, and in skillful hands is attended with little risk.

Operations for the radical cure of hernia will be performed, with the consent of the soldier, by medical officers specially designated by the Surgeon-General of the Army. Medical officers will report cases of hernia considered favorable for operation to the Surgeon-General.

If the case is considered unsuitable for operation, or if an operation is declined by the soldier, the fact will be noted upon the certificate of disability. (Decision Acting Secretary of War, August 14, 1895, 19166, A. G. O., 95.)

Since then 336 men belonging to the Regular Army have been operated on for the radical cure of hernia. Medical officers have reported also 71 cases among civilians and 59 cases among volunteer troops.

Of the 71 cases among civilians the records show that the patients varied in age from 5 to 64 years, but most of them were cases of inguinal hernia in discharged soldiers. Sixty-nine left the military hospital cured or in good condition at the end of from eighteen to one hundred and five days, but the records are unsatisfactory, as they do not follow up the subsequent histories. How many recurrences may have taken place is unknown. Of the 69 cases, 3 were double operations on inguinal hernia, 1 was a case of umbilical hernia in a female 28 years of age, and 2 were cases of hernia at the site of operations for appendicitis respectively nine and ten months prior to the hernial operation. In 1 of the 69 cases the patient, a discharged soldier, aged 42, is now drawing a pension of \$6 per month for tender cicatrix—"Hernia cured, but suffers from pain in cicatrix, which occasionally suppurates."

Two untoward results occurred in these 71 cases: A patient 61 years of age died from profound shock on the day following the operation. The other, a discharged soldier, died from congestion of the lungs three days after the hernial operation. He had just returned from the Philippines and had been dissipating heavily in San Francisco prior to the operation.

Fifteen of the 71 cases were operated upon by Col. W. H. Forwood, assistant surgeon-general, United States Army; 14 by Lieut. Col. A. C. Girard, deputy surgeon-general, United States Army, and 9 by Maj. W. C. Borden, surgeon, United States Army.

The 59 cases among the volunteer troops were reported chiefly from

Washington, D. C.; San Francisco, Cal., and Santiago, Cuba, Col. W. H. Forwood, assistant surgeon-general, and Maj. W. C. Borden, surgeon, United States Army, being the operators at the first-mentioned station; Lieut. Col. A. C. Girard, deputy surgeon-general, at the second, and Maj. L. C. Carr, surgeon, United States Volunteers, at the last. Of this series all were cases of inguinal hernia except one—a protrusion at the site of an operation for appendicitis performed one year prior to the operation for the rupture. One of the cases was a double inguinal operation. One case, operated on March 20, 1899, was discharged by order "hernia disabled" April 10, 1899, the short time elapsing between the operation and the discharge leaving it uncertain as to whether the operation was ultimately a success or a failure. The men in two other instances were mustered out shortly after the operation, with disability marked "one-fourth" in one instance and "total" in the other. Of the remaining 56 cases all were reported as in good condition at the time of muster out or other discharge from service at periods varying from thirteen days to six months and twenty-one days after operation. It has not been practicable to follow up the histories of these cases.

We have, however, a very satisfactory knowledge of the condition of the 336 cases of men belonging to the Regular Army operated on for the radical cure of hernia—gained from the muster rolls and medical records, and, in many instances, by special inquiries. Of these 336 cases no recurrence of the hernia or bad effect from the operation has been reported in 300. In 99 of the 300 a period of six months or less has elapsed since the operation was performed; in 50 a period of six to twelve months, in 80 a period of one to two years, and in 71 a period of over two years. This must be regarded as a very satisfactory result of surgical intervention to save trained soldiers for a continuance of their military career, particularly when it is recognized that 10 of the remaining 36 cases were radically cured by a second operation, 13 were discharged for disability, they having declined to submit to a second operation, 6 for tender cicatrix resulting from the operation, and 2 for weakness of the abdominal wall, rendering them unfit for the arduous duties of the military service; 4 were retained in service, and 1 case terminated fatally from suppression of urine.

Among these 36 cases, to which special attention is invited, recurrence of the hernia was reported in 21 cases at varying periods after the operation. In 10 cases within six months (mean, three and a half months); in 4, within six to twelve months (mean, eight months); in 5 within one to two years (mean, fifteen months); and in 2 after two years (mean, twenty-nine months). Of the 10 cases in which recurrence took place before six months had elapsed, 5 cases (Nos. 18, 107, 234, 244, and 253) were discharged on surgeons' certificates of disability; but in the 4 cases (Nos. 52, 84, 240, and 252) a second operation was successful, so far as shown by the records, and in the remaining case (No. 201) the patient, an old soldier, was placed on the retired list.

Of the 4 cases of recurrence between six and twelve months after the operation, 2 cases (Nos. 70 and 254) were discharged on certificates of disability; Nos. 80 and 210 remained in service.

Of the 5 cases of recurrence between one and two years after operation, 1 (No. 68) was discharged for disability, but in 4 (Nos. 105, 155, 218, and 267) a second operation was successful.

Of the 2 cases of recurrence after two years or longer, 1 case (No.

42) remains in service, and the other case (No. 121) was discharged for disability.

Thus of the 21 cases of failure in the primary operation in 336 operations, the men in 9 cases were discharged for disability, a second operation not having been undertaken, 8 were returned to effective duty after a second operation, and 4 were retained in service in no worse condition than before the unsuccessful operation.

There were also 2 cases (Nos. 276 and 328) in which it can scarcely be said that a recurrence took place, but rather that the primary operation was unsuccessful. In one of these cases a second operation appears to have been performed, and in the other a third operation before a cure was effected.

Among the 36 cases, 23 of which have already been noted, there were 4 cases that must be regarded as unsuccessful (Nos. 7, 43, 91, and 108) as the patient in each case was discharged from hospital, declining a second operation, on certificates of disability for rupture. Six cases (Nos. 36, 49, 53, 54, 231, and 246) must also be regarded as unsuccessful for the men were afterwards discharged on certificates of disability for tender cicatrix. In 2 cases (Nos. 95 and 167) although the result was good so far as concerned the cure of the rupture, the men were discharged from the service on account of weakness of the abdominal walls. The case of death (No. 170) is specially reported below.

THE THIRTY-SIX SPECIAL CASES.

Case 7.—Discharged on certificates of disability for inguinal hernia and swollen and sensitive testicle after four months of hospital treatment subsequent to the operation.

Case 18.—Recurrence four months and three days after operation or one month after leaving hospital. Discharged on certificates of disability; declined a second operation.

Case 36.—Discharged on certificates of disability for tender cicatrix, etc., over twelve months after the operation, during most of which time he was under treatment in hospital.

Case 42.—Recurrence twenty-eight months after operation or twenty-five months after leaving hospital. The patient in this instance was an officer, who is still in the service.

Case 43.—Discharged on certificates of disability four months after the operation. During most of this time he was under treatment in the hospital.

Case 49.—Discharged on certificates of disability for tender cicatrix four and one-half months after the operation or about two months after leaving hospital.

Case 52.—Recurrence from strain May 22, 1900, three and one-half months after operation. A second operation was performed June 26, 1900. No recurrence.

Case 53.—Discharged on certificates of disability for painful cicatrix four and one-half months after operation and two and one-third months after leaving hospital.

Case 54.—Discharged on certificates of disability for painful cicatrix seven months after operation and two months after leaving hospital.

Case 68.—Recurrence twelve and one-third months after operation or ten and one-half months after leaving hospital for duty. Patient declined a second operation and was discharged on certificates of disability fifteen days later.

Case 70.—Recurrence nine and one-half months after operation or eight and one-third months after returning to duty. He declined a second operation and was discharged on certificates of disability eleven days later.

Case 80.—Recurrence eight and one-half months after operation or four months after leaving hospital for duty. The patient in this case, a commissioned officer, refused a second operation and is now in service wearing a truss.

Case 84.—Recurrence by probable carelessness of patient seven weeks after operation and twelve days after leaving hospital. A second operation was immediately performed. An examination April 27, 1901, nine months after this operation, found the parts sound and with no disposition for the hernia to recur.

Case 91.—Operation not successful. Patient discharged on certificates of disability for hernia.

Case 95.—An operation for hernia in the cicatrix of an appendectomy. Result.

reported good so far as concerns the hernia, but the soldier was discharged on certificates of disability for "weak abdominal walls."

Case 105.—First operation December 12, 1895; second operation for relapse February 3, 1897. No recurrence up to December 3, 1897, when the man deserted.

Case 107.—Recurrence two and one-fifth months after operation or seventeen days after leaving hospital for a status of duty. A second operation declined. Discharged on certificates of disability for hernia.

Case 108.—Operation unsuccessful. Discharged on certificates of disability for hernia after nearly nine months in hospital.

Case 111.—Operation February 22, 1897; returned to duty March 20, 1897. No special report of the recurrence, but the Adjutant-General's records show the man to have been discharged September 2, 1899, on certificates of disability for hernia.

Case 155.—Operation March 28, 1899; discharged by order May 9, 1899. Reenlisted. Recurrence December 6, 1900. Second operation December 17, 1900; to duty February 1, 1901. No recurrence as yet reported.

Case 162.—Discharged on certificates of disability for weakness of the abdominal wall eight weeks after an operation for a hernia at the site of previous operations on the appendix.

Case 170.—As death occurred in this case, the report of the operator is given in full. I have the honor to submit the following report in the case of Private C. O. M., Third Cavalry, who was operated on for hernia at this hospital May 30, 1900, and died of acute nephritis on June 6, 1900:

Private M. reported at this hospital from Fort Totten, N. Y., per instructions from the Adjutant-General's Office, dated May 10, 1900, for operation for the radical cure of hernia, his diagnosis being "double inguinal hernia," contracted in line of duty while serving in Cuba in 1898. He was placed under observation preparatory to operation. On May 17 and 21 he had slight attacks of tertian malarial fever, his temperature rising to 102. The malarial parasite was found in his blood. Operation was deferred to insure cure of the disease before subjecting the patient to a surgical procedure. On May 26 he was discharged from the service, and reenlisted on May 28 for the Third Cavalry. At the time of his discharge he was allowed to leave the hospital to settle his final statements, and from what was learned afterwards he indulged quite freely in alcoholic liquors and had sexual intercourse, from which the gonorrhea, which subsequently developed, was contracted. On his return to the hospital he appeared to be in good condition, and I operated on May 30, doing a double operation, as he had indirect inguinal hernia on both sides. Post operative temperature was quite high, reaching 103 degrees in the afternoon of the day of the operation. He passed 12 ounces of urine that night, and the next morning his temperature dropped to 99 degrees. On May 31, the day after the operation, he passed 24 ounces of turbid urine. He appeared to be in fair condition, his temperature in the evening being 98.6. The next day his morning temperature was subnormal, 96.2. There was a profuse discharge from the urethra, in which numerous gonococci were found, and on inquiry the patient gave the history of the possible venereal infection before referred to. His urine had diminished in quantity, 12 ounces in 24 hours, and microscopical examination showed a great many blood cells with granular and epithelial casts. His temperature in the evening was 99.6. On June 2 and 3 he had practically suppression of urine, but a few drops being passed, and catheterization showing none in the bladder. On June 4, 5, and 6 he passed about 3 ounces each day. The gonorrheal discharge was very profuse. His pulse rate was low, never rising above 86 after the operation. There was no indication of infection or septicemia as a result of the operation. The trouble appeared to be entirely confined to the kidneys. The usual treatment for acute nephritis was adopted, but without result, and the patient died on the morning of June 6, seven days after the operation.

An autopsy was made by Dr. Lamb, of the Army Medical Museum, and the following conditions were disclosed: Body that of a well-nourished man in the prime of life. The dressings were removed from the operation wounds, and they were found to be united by first intention, without a trace of suppuration or inflammation. The thorax and abdomen were opened. The heart and lungs were normal; the peritoneum was normal, there being no evidence of peritonitis or infection; the liver was normal; the spleen enlarged to twice the normal size, and of dark slate color; both kidneys enlarged, together weighing 18 ounces, multiple cortical hemorrhages and oedema in each; the capsule was adherent in places, and on section of the kidneys they were found to be greatly congested, and presented every appearance of acute hemorrhagic nephritis. The kidneys are now in the Army Medical Museum, No. 11984.

The site of operation was carefully examined. The union of the tissues, as sutured together in Bassini's operation, was found to be firm. It was interesting to note that on the inner surface of the abdomen, to the point where the neck of the sac existed, the high ligation of the sac practiced in operation had entirely obliterated any depres-

sion in the inner surface of the abdomen, showing that the high ligation, as practiced in Bassini's operation, removes the depression in the inner surface of the abdomen at the internal ring, and so does away with this predisposing cause of hernia.

The autopsy confirmed the diagnosis and showed that death was due to acute hemorrhagic nephritis, but the question was left in doubt as to whether the nephritis was due to the gonorrheal infection, to the ether used in anæsthesia, or to irritation of the kidneys by alcoholic excess in which the patient indulged when he was discharged, or to a combination of these factors.

Case 201.—Operation October 10, 1897, for double inguinal hernia; returned to duty February 1, 1898. A small incomplete ventral hernia on right side was reported April 16, 1898. This man, an old soldier, was placed on the retired list May 14, 1899.

Case 210.—Recurrence nearly seven months after operation. In service, wearing a truss.

Case 218.—Recurrence nearly fourteen months after operation. Second operation five days later, on August 28, 1900; no recurrence reported.

Case 231.—Discharged five and one-half months after operation, on certificates of disability for weak abdominal wall, with persistent pain at site of the injury.

Case 234.—A double operation on April 23, 1900; to duty May 28 following. Recurrence on left side July 29, on right side October 16. Discharged December 24, 1900, on certificates of disability for recurrent double hernia and syphilis.

Case 240.—Recurrence six months after operation. A second operation performed; present for duty in the Philippines February 28, 1901, seventeen and one-half months after second operation.

Case 244.—Recurrence three months after operation or one and one-third months after leaving hospital. Discharged on certificates of disability for hernia.

Case 246.—Discharged on certificates of disability five and one-half months after operation for neuralgia of inner side of thigh and scar following operation.

Case 252.—Operation May 9, 1899; duty June 12, 1899; recurrence in two months. Truss worn until second operation, February 16, 1901. To duty April 8, 1901.

Case 253.—Recurrence five months after operation or three and one-half months after leaving hospital. Discharged on certificates of disability for hernia.

Case 254.—Discharged on certificates of disability for hernia six and one-half months after operation or four and one-half months after leaving hospital.

Case 267.—Recurrence fifteen months after operation or thirteen months after leaving hospital. A second operation performed October 13, 1900; duty in sixty-three days.

Case 276.—Operation October 7, 1899, continuous treatment in hospital until a second operation was performed January 13, 1900; to duty April 16, 1900. No recurrence reported.

Case 328.—Operation June 20, 1900, at Dagupan, P. I. Continuous treatment until a second operation was performed, also at Dagupan, August 20, 1900. A third operation was performed at the First Reserve Hospital, Manila, P. I., January 18, 1901. "Remaining without recurrence on the hospital ship *Relief*, May 31, 1901."

In this tabulation of 336 cases the principal operators were Maj. W. P. Kendall, surgeon, United States Army, who reported 58 cases; Maj. W. C. Borden, surgeon, United States Army, 53 cases; Maj. J. M. Banister, surgeon, United States Army, 36 cases; Lieut. Col. A. C. Girard, deputy surgeon-general United States Army, 30 cases, and Col. W. H. Forwood, assistant surgeon-general, United States Army, 26 cases.

Since the tabulation was made the following cases have been operated on or reported:

Name.	Organization.	Age.	Hernia.	Date of operation.	Operator.
W. S. C.	Civilian	26	Left inguinal	Apr. 7, 1901	Maj. W. C. Borden, surgeon, U. S. A.
G. H.	Corpl., 6 Co., C. Art.	23	Right inguinal ...	Apr. 23, 1901	
G. R. C.	Pvt., 41 Co., C. Art.	25	...do	Apr. 28, 1901	
E. W.	Pvt. Bd., 4th Art.	51	Left inguinal	May 14, 1901	
J. J. M.	Civilian	20	Right inguinal ...	June 4, 1901	
H. A. R.	2d Lt., 8th Cav.	24	...do .....	...do
R. H. L.	Sgt. N. C. S., 28th V. I.	27	...do	June 28, 1901	First Lieut. P. C. Fauntleroy, assist- ant surgeon, U. S. A.
W. H. J.	1st Sgt. 27th V. I.	23	...do .....	...do
J. G.	Pvt. K, 3d Inf.	29	...do	June 10, 1901	

Name.	Organization.	Age.	Hernia.	Date of operation.	Operator.
H. T.	Q. M. employee		Right inguinal	Mar. 25, 1901	Lieut. Col. A. C. Gilrard, deputy surgeon-general, U. S. A.
W. G.	Pvt., A, 3d V. I.		Ventral	Mar. 13, 1901	
J. P.	Corpl., L, 26th V. I.		Right inguinal	Mar. 14, 1901	
W. H. C.	Pvt., B, 26th V. I.		do	Apr. 30, 1901	
P. R. B. C.	Pvt., B, 28th V. I.		do	Apr. 23, 1901	
E. F.	Pvt., I, 4th Cav.		do	Apr. 16, 1901	
J. B., jr.	Civilian	5	do	May 27, 1901	
E. S.	Tpt. Btl. 3d Art.		Left inguinal	May 25, 1901	
G. M. S.	Pvt., B, Engns.		Right inguinal	May 1, 1901	
C. W. C. N.	Civilian	40	do	Apr. 30, 1899	
C. McL.	Late Pvt. B, 5th Inf.	31	do	June 22, 1899	Maj. L. A. La Garde, surgeon, U. S. A.
J. H. G.	Late Co. M, 3d Art.	48	do	Nov. 21, 1899	
R. S.	Late Co. G, 16th Inf.	58	do	Sept. 22, 1900	
M. W.	Late Co. F, 2d Inf.	42	Left inguinal	Dec. 18, 1900	
F. A. T.	Late Hspl. Corps.	31	Right inguinal	Dec. 15, 1900	
W. E. T.	do	27	do	Mar. 22, 1901	
F. C. P.	Pvt. F, 2d Cav.	25	Left inguinal	June 20, 1901	
R. M.	Pvt., B, 14th Cav.	21	Right inguinal	May 8, 1901	
E. K. W.	Corpl., A, 11th Cav.	22	do	May 15, 1901	
H. S. ²	Corpl., H, 3d Art.	37	do	May 31, 1899	Col. W. H. Forwood assistant surgeon general, U. S. A.
M. McC. ²	Female civilian		do	Oct. 25, 1899	
W. S. ²	Pvt., 1st Mont. Vols.		Right inguinal	May 31, 1899	
R. B.	Pvt., B, 6th Cav.	23	Left inguinal	Feb. 9, 1900 and June 25, 1900.	Maj. Charles Richard, surgeon, U. S. A.
I. C. C.	Hspl. steward	41	Double inguinal	Nov. 8, 1900	
W. A.	Corpl., L, 1st Inf.	22	do	Apr. 11, 1901	
J. A.	Pvt., M, 1st Inf.	38	Right inguinal	June 18, 1901	
J. L.	Pvt., C, 6th Cav.	19	do	June 26, 1901	

¹ Reenlisted.² No special report on file in this office covering these cases.

STERILIZATION OF ANIMAL LIGATURES AND OF SEA SPONGE.

In connection with these operations for hernia and other surgical proceedings, Col. W. H. Forwood, assistant surgeon-general, United States Army, has submitted his methods for the sterilization of animal ligatures and of sea sponge, as follows:

Sterilization of animal ligatures, catgut, kangaroo tendon, etc.—Use large, long test tubes, say 10 inches by 1 inch, with pure rubber plugs and glass spools. Thoroughly clean and boil spools, tubes, and plugs. Wind catgut ligature on glass spools, make the kangaroo tendon into oval coils and place them in the tubes according to size and kind. Immerse in ether for four, U. S. P., forty-eight hours, and then wash in ether. Immerse in alcohol with $\frac{1}{1000}$ bichloride of mercury (C. P.); boil twenty minutes in a water or sand bath with the plugs out; remove the tubes while boiling and plug immediately (so as to form a vacuum and remove air from ligatures), and then set aside twenty-four hours. Renew alcohol with $\frac{1}{1000}$ bichloride, and add 1 per cent of tricresol and store away ready for use. (If there be no sediment this renewal of alcohol will be superfluous.) The ligature should be kept at least three days, but it may remain any length of time in this solution before use.

On using, flame the tube, draw out the spools or coils with sterile forceps and place them in a sterile (boiled) ligature dish, with the fluid from the tube, or in common alcohol with $\frac{1}{1000}$ bichloride.

Ten years' experience shows that this method increases the tensile strength of the ligature and renders it absolutely sterile.

Sterilization of sea sponge.—Ordinary commercial formalin affords a convenient means for the complete sterilization of sea sponge. After the sponges have been freed from foreign matter, washed and dried in the usual way, they are to be placed in a wide-mouthed glass jar with a well ground glass stopper and a small quantity of the formalin solution poured over them sufficient to moisten them thoroughly. A portion of the fluid settles in a layer at the bottom while the formaldehyde gas and watery vapor fills the upper part of the jar and penetrates every fiber of the sponge. There they may be kept in store for months or even years without injury. After two or three days they are ready for use. When wanted the sponge is removed from the jar with forceps to avoid injury of the hand, and well rinsed in warm, not hot, sterile water to remove all the formalin which is injurious to the tissues. They should then be placed in warm normal salt solution for use. Experiments begun in



STERILIZATION OF ANIMAL LIGATURES.



1892 with dirty sponges from the deadhouse and kitchen at the Barnes Hospital Washington, D. C., proved the effectiveness of this method. The usual laboratory tests showed even with these sponges, no living organism after forty-eight hours in formalin solution of 40 per cent formaldehyde. Six years' constant use of sponges prepared in this way has given perfect results without a single case of infection from that source.

GUNSHOT INJURIES.

On December 31, 1899, as stated in my last annual report, there remained under treatment 216 cases of gunshot injury, but at the date of that report, October 17, 1900, only 15 of these continued on the sick reports. None of these cases terminated fatally; 3 were returned to duty, one of which was a fracture of the middle third of the femur, and 12 were discharged from the service on account of disability, as shown in the following tabulations:

Gunshot-wound cases remaining in hospital at date of last annual report, showing dispositions.

REGULARS AND VOLUNTEERS.

Character and location of wound.	Remaining at last report.	Disposition in 1900.	
		Duty.	Certificates of disability.
Head, fracture	1		1
Thorax:			
Nonpenetrating	2	1	1
Penetrating	1		1
Abdomen, penetrating	1		1
Thigh:			
Flesh	4	1	3
Fracture middle third	1	1	
Fracture lower third	1		1
Foot, flesh	3		3
Tarsus and metatarsus fracture	1		1
Total	15	3	12

REGULARS.

Thorax:			
Nonpenetrating	1	1	
Penetrating	1		1
Thigh:			
Flesh	3	1	2
Fracture lower third	1		1
Foot, flesh	2		2
Tarsus and metatarsus fracture	1		1
Total	9	2	7

VOLUNTEERS.

Head, fracture	1		1
Thorax, nonpenetrating	1		1
Abdomen, penetrating	1		1
Thigh:			
Flesh	1		1
Fracture middle third	1	1	
Foot, flesh	1		1
Total	6	1	6

During the calendar year 1900, 377 men were killed by gunshot—305 in action and 21 by accident; 30 of the deaths were suicidal and 21 homicidal, as shown in the following tables:

Killed by gunshot.

REGULAR AND VOLUNTEER ARMIES, 1900.

Character and location of wounds.	How received.					Nature of missile.									
	Not in action.					In action.					Not in action.				
	In action.	Accidental.	Suicide.	Homicide.	Total.	Mausser.	Remington.	Remington, dum-dum.	Krag-Jörgensen.	Krag-Jörgensen, dum-dum.	Bullets, not stated.	Shrapnel.	Slugs.	Shell.	Shell.
Head, fracture.....	78	5	22	4	109	26	21	1	1	57	1	1			
Face, fracture.....	12	1			13	1				1					
Neck.....	18	2		1	21	1	4			6					
Thorax, penetrating....	101	9	5	13	128	22	25		3	39	1	1		1	16
Abdomen, penetrating....	52	3	2		57	19	10		2	1	19			2	8
Clavicle or scapula, fracture.....	1				1		1								
Arm, fracture.....	1				1		1								
Thigh, flesh.....	3				3		3								
Leg, fracture.....	1				1					1					
Unknown.....	48	1	1	3	53	3				45					1
Total.....	305	21	30	21	377	84	68	1	6	1	138	2	2	2	1

¹ Fracture of jaw and severing tongue from floor of mouth in one case, facial artery severed in another, hemorrhage post jugular vein in the other.

² Hemorrhage subclavian artery.

³ Severing brachial artery.

⁴ Femoral hemorrhage mentioned in one case.

⁵ Shock.

REGULARS, 1900.

Character and location of wound.	How received.					Nature of missile.									
	Not in action.					In action.					Not in action.				
	In action.	Accidental.	Suicide.	Homicide.	Total.	Mausser.	Remington.	Remington, dum-dum.	Krag-Jörgensen.	Krag-Jörgensen, dum-dum.	Bullets, not stated.	Shrapnel.	Slugs.	Shell.	Shell.
Head, fracture.....	38	2	17	2	59	10	6	1		19	1	1		3	13
Face, fracture.....	1				1					1					
Neck.....	12	1		1	14	4	3			4				1	
Thorax, penetrating....	43	6	3	8	60	11	12		3	15	1	1		2	10
Abdomen, penetrating....	24		1		25	8	3			1	11			1	5
Clavicle or scapula, fracture.....	1				1										
Arm, fracture.....	1				1		1								
Leg, fracture.....	1				1										
Unknown.....	8	1	1	1	11					8					1
Total.....	129	10	22	12	173	33	26	1	3	1	59	2	2	2	1

¹ Fracture of jaw and severing tongue from floor of mouth.

² Hemorrhage subclavian artery.

³ Severing brachial artery.

⁴ Shock.

Killed by gunshot—Continued.

VOLUNTEERS, 1900

Character and location of wound.	How received.					Nature of missile.							
	In action.	Not in action.			Total.	In action.					Not in action.		
		Accidental.	Suicide.	Homicide.		Mausier.	Remington.	Krag-Jørgensen.	Revolver.	Bullets, not stated.	Krag-Jørgensen.	Revolver.	Bullets, not stated.
Head, fracture.....	40	3	5	2	50	16	15	1	.....	8	4	3	3
Face, fracture.....	11	2 ¹	.....	.....	2	1	.....	.....	.....	.....	1	.....	.....
Neck.....	6	1	.....	.....	7	3	1	.....	.....	2	.....	.....	1
Thorax, penetrating.....	68	3	2	6	68	17	16	7	1	24	2	5	3
Abdomen, penetrating.....	28	3	1	.....	32	11	7	2	.....	8	1	1	2
Thigh, flesh.....	23	.....	.....	.....	3	.....	3	.....	.....	.....	.....	.....	.....
Unknown.....	40	.....	.....	2	42	3	.....	.....	.....	37	.....	.....	2
Total.....	176	11	8	9	204	51	42	3	1	79	8	9	11

¹Severed facial artery.²Hemorrhage post jugular vein.³Femoral hemorrhage mentioned in one case.

Besides the 377 killed by gunshot, 1,173 cases were received in the hospital for treatment; 782 were incurred in action, 315 not in action but in line of duty, 57 not in line of duty, while 12 were suicidal and 7 homicidal.

Ninety-two of the 1,173 cases proved fatal, 70 of which were battle wounds, 12 received in line of duty, 3 not in line of duty, 4 were suicidal, and 3 homicidal.

Of the total number struck by gunshot missiles, 469, or 30.3 per cent, died from the injuries inflicted. The killed constituted 24.3 per cent of those struck and the wounded 75.7. One man was killed for every 3.1 men wounded. This is a much heavier death record than was given by the gunshot wounds of 1898 and 1899. During those years the killed constituted 11.9 per cent of those struck, the wounded 88.1 per cent, or 1 man killed for 7.4 wounded. The nature of the missile is not stated in 33 per cent of the cases; the Mauser bullet is noted in 23 per cent, the Remington in 16 per cent, the Krag-Jørgensen in 11 per cent, and the revolver in as high as 8 per cent of the total.

The following tabulations give the statistical data of—

All gunshot wounds:

Regulars and Volunteers.

Regulars.

Volunteers.

Gunshot wounds received in action:

Regulars and Volunteers.

Regulars.

Volunteers.

Gunshot wounds other than battle wounds:

Regulars and Volunteers.

Regulars.

Volunteers.

All gunshot wounds.

REGULAR AND VOLUNTEER ARMIES, 1900.

Character and location of wounds.	How received.					Nature of missile.							
	Not in action.					Total.	Mauzer.	Remington.	Krag-Jørgensen.	Winchester.	Mannlicher.	Bullet, brass.	Bullets, not stated.
	In action.	In line of duty.	Not in line of duty.	Suicidal.	Homicidal.								
Head:													
Flesh	22	2	3	3	1	31	10	2	5			10	2
Fracture	15	5		1	1	22	5	3	3			5	3
Face:													
Flesh	13	5				18	2	2				7	
Fracture	8	3	2			13	3	1	1			3	4
Neck:													
Flesh	18	4	1			23	9	1	4			6	2
Spine, fracture	13					13	4	2				6	
Thorax:													
Nonpenetrating	29	7	1	1		38	12	7	2	2		9	3
Penetrating	15	5	4	7	2	43	20	13	4			17	9
Abdomen:													
Nonpenetrating	9	8				17	4	1	2			7	2
Penetrating	27	5	2		1	35	9	6	3			14	2
Pelvis, fracture	4					4	1	1				1	
Back and hip, flesh	51	13	2			66	16	10	7			13	5
Perineum, genital and urinary organs	2	2	1			5	1	1	2			1	1
Shoulder:													
Flesh	26	10	3			39	9	4	3			19	3
Fracture clavicle or scapula	5					5	2	1				1	
Joint	5		1		1	7		2	1			3	
Arm:													
Flesh	58	6	4			68	25	11	6			20	4
Fracture	19	1				20	7	6	3			2	
Elbow joint	16	3				19	4	2	2			8	
Forearm:													
Flesh	30	12	2			44	10	2	5		1	12	8
Fracture	16	5	2			23	5	5	5			4	2
Wrist joint	3	1				4		1				2	
Hand, flesh	28	38	4			70	13	3	10			27	13
Carpus and metacarpus, fracture	12	15	4			31	4	4	11			8	3
Fingers, fracture	3	42	4			49	1	1	19			20	5
Hip joint	2					2	1						
Thigh:													
Flesh	128	28	8		1	165	37	40	11			47	16
Fracture, upper third	15	1				16	3	4	2			7	
Fracture, middle third	5	2				7	2	1	2			2	
Fracture, lower third	12	2				14	6	5				2	1
Kneejoint	15	1	1			20	6	1	1			5	3
Leg:													
Flesh	67	26	1			94	21	16	7			25	20
Fracture	28	16	1			45	6	8	7		2	10	8
Ankle joint	5	2	1			8		2	3			3	
Foot, flesh	19	22	3			44	5	4	15			17	2
Tarsus and metatarsus, fracture	19	13	1			33	6	4	9			8	4
Toes, fracture	1	7	1			9			5			2	2
Unknown	1					1						1	
Total	782	315	57	12	7	1,173	268	177	161	2	2	1	353
													127
													8

¹ Remaining in hospital May 31, 1901.

² Remaining in hospital April 30, 1901.

³ Remaining in hospital June 30, 1901.

⁴ Remaining in hospital April 30, 1901, and June 30, 1901.

All gunshot wounds.

REGULAR AND VOLUNTEER ARMIES, 1900.

Nature of missile.													Disposition.												
Gravel propelled by striking bullets.	Brass cover of bullet.	Percussion cap for dynamite shell.	Explosion of dynamite primer.	Explosion of gun.	Explosion of cartridge.	Fragment exploded bullet.	Explosion of powder.	Slugs.	Iron slug from cannon.	Shell.	Shrapnel.	One-pounder.	Total.	Duty.	Certificates of disability.	Died.	Discharged by order.	Expiration of service and muster out.	Missing in action.	Deserted.	Death, other causes.	Remaining last report.	Total.		
1					3	1	1	1		2			31 22	30 1	10	1 10						11	31 22		
							1						18 13 23 13	15 7 4 1	2 3 4		1 1	1			1	21	18 13 23 13		
										3			38 63	37 28	17	16		1			1	31	38 63		
					1						1		17 35 4	16 5 1	1 2	28			1				17 35 4		
								1	1	1			54 5	49 5	1	1		1			2	54 5			
	1										1		39 5 7	31 4 1	6 6		1	1				39 5 7			
										2			68 19	55 2	9 15	2 1	1				21 1	68 19			
					1	2					1		44 23 4	40 10 4	3 3 4			1				44 23 4			
	1				1	3							70 31 15	67 13		1	1				11 12	70 31 15			
	1	1									1		49 2	36 9	1 1	1		1		2	1	49 2			
					1	2			1	1	6		165 7	143 4	13 3	4 2	2 1	2	1			165 7			
											3		14 20	1 4	10 9	2 3				1	1	14 20			
										1	4		94 45	82 16	7 21		2 1	2 1				81 5	94 45		
													8	40	5	1		2			11	8			
					1					1			33 9	15 8	12 1	1	2	2			1	33 9			
1	4	1	1	1	10	5	1	4	4	20	21	1	1,173	791	224	92	14	17	1	3	6	25	1,173		

* Remaining in hospital July 31, 1901.

* Remington bullet and detached brass jacket.

†1 death in 1901.

*2 remaining in hospital May 31, 1901, and 3 June 30, 1901.

All gunshot wounds--Continued.

REGULAR ARMY, 1900.

Character and location of wounds.	How received.					Nature of missile.							
	Not in action.												
	In action.	In line of duty.	Not in line of duty.	suicidal.	Homicidal.	Total.	Mausser.	Remington.	Krag-Jorgensen.	Winchester.	Mannlicher.	Bullet, brass.	Bullets, not stated.
Head:													
Flesh	13	2	2	3	1	21	4	2	3				8
Fracture	9	4		1	1	15	2	1	3				5
Face:													
Flesh	3	3				6		1					2
Fracture	3	2	2			7			1				2
Neck	7	2	1			10	2		1				4
Spine, fracture	6					6							5
Thorax:													
Nonpenetrating	9	5	1	1		16	5		1				4
Penetrating	20	3	3	6	2	34	6	4	3				14
Abdomen:													
Nonpenetrating	2	5				7			1				4
Penetrating	14	2	2		1	19	4	1	1				10
Pelvis, fracture	1					1							1
Back and hip, flesh	15	8	2			25	4	4	5				7
Perineum, genital and urinary organs		1				1			1				
Shoulder:													
Flesh	14	3	3			20	3	2	1				12
Fracture clavicle or scapula	1					1							1
Joint	5				1	6		2	1				2
Arm:													
Flesh	23	4	2			29	7	3	3				12
Fracture	6					6	3	1	1				1
Elbow joint	10	1				11	1	1					7
Forearm:													
Flesh	12	7	2			21	3						8
Fracture	7	1	1			9	2	2	1				2
Wrist joint	3					3		1					1
Hand, flesh	11	18	3			32	3	2	4				13
Carpus and metacarpus, fracture	8	8	2			18	3	2	6				3
Fingers, fracture	1	19	3			23		1	5				11
Hip joint	2					2	1						
Thigh:													
Flesh	50	19	8		1	78	10	13	5				30
Fracture upper third	5	1				6	1	2	1				2
Fracture middle third	4	1				5	2	1	1				1
Fracture lower third	1	2				3		1					1
Knee joint	8	2	1			11	1	1					4
Leg:													
Flesh	32	12				44	6	5	1				18
Fracture	17	9	1			27	2	2	4		2		7
Ankle joints	4	1	1			6		1	2				3
Foot, flesh	9	5				14		2	2				8
Tarsus and metatarsus fracture	10	8				18	2	1	2				7
Toes, fracture		1	1			2							1
Unknown	1					1							1
Total	346	159	41	11	7	564	77	59	59	...	2	...	222
													82
													5

¹ Remaining in hospital May 31, 1901.² Remaining in hospital April 30, 1901.³ Remaining in hospital June 30, 1901.⁴ Remaining in hospital April 30, 1901, and June 30, 1901.

All gunshot wounds—Continued.

REGULAR ARMY, 1900.

Nature of missile.													Disposition.												
Gravel propelled by striking bullets.	Brass cover of bullet.	Percussion cap for dynamite shell.	Explosion of dynamite primer.	Explosion of gun.	Explosion of cartridge.	Fragment exploded bullet.	Explosion of powder.	Slugs.	Iron slug from cannon.	Shell.	Shrapnel.	One-pounder.	Total.	Duty.	Certificates of disability.	Died.	Discharged by order.	Expiration of service and muster out.	Missing in action.	Deserted.	Death, other causes.	Remaining last report.	Total.		
										2			21	20		1							12		
										2			15		7	7						1	15		
					2		1			1			6	5							1		6		
										1			7	4	1		1					2	7		
										1			10	7	3								10		
													6		2	4							6		
										3			16	15								1	16		
													34	15	12	6					1		34		
														7	7								7		
											1		19	3	2	14							19		
													1		1								1		
									1	1			25	22	1							4	25		
													1	1									1		
											1		20	16	4								20		
													1	1									1		
										1			6		5	1							6		
										2			29	24	4							5	29		
										1			6	2	3							1	6		
										1	1		11		10							2	11		
					1	1					1		21	18	3								21		
													9	4	5								9		
											1		3		3								3		
													32	31								1	32		
													18	7	9							2	18		
		1	1										23	17	4					1		1	23		
	6												2		1	6							2		
					1					1	6		78	68	9	1							78		
													6	2	1	1					3		6		
													5		2	2					1		5		
													3		1	1					1		3		
											3		11	1	6	2				1		1	11		
										1	4		44	41	2							1	44		
										2	2		27	10	12							1	27		
													6		4	1						1	6		
													14	11				2				2	14		
					1					1			18	10	7	1							18		
													2	1	1								2		
													1			1							1		
....	1	1	1	1	8	1	1	1	1	20	21	1	564	363	125	44	1	2	...	2	2	25	564		

6 Remaining in hospital July 31, 1901.

6 Remington bullet and detached brass jacket.

7 Died in 1901.

8 2 remaining in hospital May 31, 1901, and 3 remaining June 30, 1901.

All gunshot wounds—Continued.

VOLUNTEER ARMY, 1900.

Nature of missile.													Disposition.										
Gravel propelled by striking bullet.	Brass cover of bullet.	Percussion cap for dynamite shell.	Explosion of dynamite primer.	Explosion of gun.	Explosion of cartridge.	Fragment exploded bullet.	Explosion of powder.	Slugs.	Iron slug from cannon.	Shell.	Shrapnel.	One-pounder.	Total.	Duty.	Certificates of disability.	Died.	Discharged by order.	Expiration of service and muster out.	Missing in action.	Deserted.	Death, other causes.	Remaining last report.	Total.
	1				1	1		1					107	107	3	3							107
													126	126	2	2		1					126
													137	137	1	5	1						137
													2229	2229	5	10		1					2229
					1				1				1016	1016	1	14							1016
													33	33	1			1					33
													294	294	1	1		1					294
													44	44									44
	1												194	194	2		1	1					194
													43	43	1								43
									1				3914	3914	5	2	1						3914
									1				85	85	7	1		1					85
						1							2314	2314	8			1					2314
								1					16	16	1								16
	1												3813	3813	1	1							3813
													2619	2619	5			1		1			2619
	1					2			1				8710	8710	4	3	2	2	1				8710
													22	22	1						1		22
													119	119	9	1							119
													93	93	3	1	1				1		93
													5018	5018	5		2	2					5018
													22	22	9	1	1	1					22
													3015	3015	1							1	3015
													77	77	5		2	2					77
1	3				2	4		3	3				609	428	99	48	13	15	1	1	4		609

Gunshot wounds received in action.

REGULAR AND VOLUNTEER ARMIES, 1900.

Character and location of wound.	Nature of missile.							
	Natuer.	Remington.	Krag-Jørgensen.	Winchester.	Mannlicher.	Bullet, brass.	Bullets, not stated.	Revolver.
Head:								
Flesh.....	10	2	2				6	
Fracture.....	5	2	1				3	
Face:								
Flesh.....	2	2					6	
Fracture.....	3	1					3	1
Neck	9	1	1				6	
Spine, fracture.....	4	2					6	
Thorax:								
Nonpenetrating.....	12	7		2			5	1
Penetrating.....	20	13	1				11	
Abdomen:								
Nonpenetrating.....	4	1					4	
Penetrating.....	9	6					11	
Pelvis, fracture.....	1	1					1	
Back and hip, flesh.....	16	10	2				8	1
Perineum, genital and urinary organs.	1	1						
Shoulder:								
Flesh.....	9	4					12	
Fracture clavicle or scapula.....	2	1					1	
Joint.....		2					2	
Arm:								
Flesh.....	25	11	2				18	
Fracture.....	7	6	2				2	
Elbow joint.....	4	2					7	
Forearm:								
Flesh.....	10	2	4			1	10	
Fracture.....	5	5					4	
Wrist joint		1					1	
Hand, flesh.....	11	3					12	
Carpus and metacarpus, fracture.....	4	4	1				2	
Fingers, fracture.....	1	1					1	
Hip joint.....	1							
Thigh:								
Flesh.....	37	40	3				35	1
Fracture upper third.....	3	4	1				7	
Fracture middle third.....	2	1					2	
Fracture lower third.....	6	5					1	
Knee joint.....	6	1					4	1
Leg:								
Flesh.....	21	16	3				22	
Fracture.....	6	8			2		8	
Ankle joint.....		2					3	
Foot, flesh.....	5	3	1				10	
Tarsus and metatarsus, fracture.....	6	4	1				7	
Toes, fracture.....		1						
Unknown.....							1	
Total	267	176	26	2	2	1	242	2
								3
								1

¹ Remaining in hospital May 31, 1901.

² Remaining in hospital April 30, 1901.

³ Remaining in hospital April 30, 1901, and June 30, 1901.

⁴ Remaining in hospital July 31, 1901.

Gunshot wounds received in action.

REGULAR AND VOLUNTEER ARMIES, 1900.

Nature of missile.									Disposition.									
Brass cover of bullet.	Explosion of gun.	Fragment exploded bullet.	Explosion of powder.	Slugs.	Iron slug from cannon.	Shell.	Shrapnel.	One-pounder.	Total.	Duty.	Certificate of disability.	Died.	Discharged by order.	Expiration of service and muster out.	Missing in action.	Death, other causes.	Remaining last report.	Total.
		1				2			22	21	7	1					1	22
			1	1		1			13	11	1					1		13
						1			8	3	3			1			2	8
						1	1		18	12	4	1	1					18
									13		4	9						13
						2			29	29	14	10		1				29
									45	20								45
									9	8	1							9
							1		27	3	2	22						27
				1					4	1	2			1				4
					1	1			39	35	1	1					2	39
									2	2								2
							1		26	20	5			1				26
1						1			5	4	1	1						5
									5		4	1						5
						2			58	45	9	2	1				1	58
					1	1			19	6	10	1		1			1	19
					1	1		1	16	1	14	1						16
		2					1		30	27	2			1				30
				2					16	6	10							16
1	1						1		3		3							3
							1		28	27			1					28
									12	5	6						1	12
									3	1	1	1					1	3
1									2		1	1						2
1		2			1	1	6		128	107	13	3	2	2	1			128
									15	3	6	3	1				2	15
									5		2	1				1	1	5
									12	1	10	1						12
							3		15	4	6	3	1				1	15
						1	4		67	59	6		1	1				67
						2	2		28	5	18		1	1			3	28
									5		4	1						5
									19	16	1			2				19
						1			19	8	5	1	2	2		1		19
									1	1								1
									1			1						1
4	1	5	1	4	4	19	21	1	782	492	176	70	11	14	1	3	15	782

* Remington bullet and detached brass jacket.

* One death in 1901.

* Remaining in hospital June 30, 1901.

* One remaining in hospital May 31, 1901, and two remaining June 30, 1901.

Gunshot wounds received in action—Continued.

REGULAR ARMY, 1900.

Character and location of wound	Nature of missile.							
	Mauzer.	Remington.	Krag-Jorgensen.	Winchester.	Mannlicher.	Bullet, brass.	Bullets, not stated.	Revolver.
Head:								
Flesh.....	4	2	1				4	
Fracture.....	2	1	1				3	
Face:								
Flesh.....		1					1	
Fracture.....							2	
Neck.....	2						4	
Spine, fracture.....							5	
Thorax:								
Nonpenetrating.....	5						1	1
Penetrating.....	6	4					10	
Abdomen:								
Nonpenetrating.....							2	
Penetrating.....	4	1					8	
Pelvis, fracture.....							1	
Back and hip, flesh.....	4	4	1				4	
Shoulder:								
Flesh.....	3	2					8	
Fracture clavicle or scapula.....							1	
Joint.....		2					2	
Arm:								
Flesh.....	7	3					11	
Fracture.....	3	1					1	
Elbow joint.....	1	1					6	
Forearm:								
Flesh.....	3						7	
Fracture.....	2	2					2	
Wrist joint.....		1					1	
Hand, flesh.....	3	2					5	
Carpus and metacarpus, fracture.....	3	2					2	
Fingers, fracture.....		1						
Hip joint.....	1							
Thigh:								
Flesh.....	10	13	1				19	
Fracture upper third.....	1	2					2	
Fracture middle third.....	2	1					1	
Fracture lower third.....		1						
Knee joint.....	1	1					3	
Leg:								
Flesh.....	6	5					16	
Fracture.....	2	2			2		7	
Ankle joint.....		1					3	
Foot, flesh.....		2					7	
Tarsus and metatarsus, fracture.....	2	1					6	
Unknown.....							1	
Total.....	77	59	4		2		156	1

¹ Remaining in hospital May 31, 1901.² Remaining in hospital April 30, 1901.³ Remaining in hospital April 30, 1901, and June 30, 1901.⁴ Remaining in hospital July 31, 1901.

Ganshot wounds received in action—Continued.

REGULAR ARMY, 1900.

Nature of missile.										Disposition.								
Brass cover of bullet.	Explosion of gun.	Fragment exploded bullet.	Explosion of powder.	Slugs.	Iron slug from cannon.	Shell.	Shrapnel.	One-pounder.	Total.	Duty.	Certificate of disability.	Died.	Discharged by order.	Expiration of service and muster out.	Missing in action.	Death, other causes.	Remaining last report.	Total.
						2			13	12		1						13
						2			9		4	4					1	9
			1						3	2						1		3
						1			3	1	1						2	3
						1			7	4	5							7
							1		6		2	4						6
									9	9								9
						2			20	9	9	2						20
									2	2								2
							1		14	1	2	11						14
									1		1							1
					1	1			15	12	1						3	15
							1		14	10	4							14
									1	1								1
						1			5		4	1						5
						2			23	18	4						1	23
						1			6	2	3						1	6
						1		1	10		10							10
		1					1		12	10	2							12
				1					7	3	4							7
							1		3		3							3
									11	11								11
							1		8	2	5						1	8
									1								1	1
1									2		1	1					1	2
									1									1
						1	6		50	41	9							50
									5	1	1	1					2	5
									4		2	1					1	4
									1		1							1
							3		8	1	4	2					1	8
						1												
						1	4		32	30	2							32
						2	2		17	4	10						3	17
									4		4							4
									9	7				2				9
						1			10	6	3	1						10
									1		1							1
1	1	1	1	1	1	19	21	1	346	199	99	30		2		1	15	346

* Remington bullet and detached brass jacket.

* Died in 1901.

* Remaining in hospital June 30, 1901.

* One remaining in hospital May 31, 1901, and two remaining June 30, 1901.

Gunshot wounds received in action—Continued.

VOLUNTEER ARMY 1900.

Character and location of wound.	Nature of missile.								
	Maisser.	Remington.	Krag-Jørgensen.	Winchester.	Mannlicher.	Bullet, brass.	Bullets, not stated.	Revolver.	Small shot. Gravel propelled by striking bullets.
Head:									
Flesh.....	6		1				2		
Fracture.....	3	2							
Face:									
Flesh.....	2	1					5		1
Fracture.....	3	1					1		
Neck:									
Flesh.....	7	1	1				2		
Spine, fracture:									
.....	4	2					1		
Thorax:									
Nonpenetrating.....	7	7		2			4		
Penetrating.....	14	9	1				1		
Abdomen:									
Nonpenetrating.....	4	1					2		
Penetrating.....	5	5					3		
Pelvis, fracture:									
.....	1	1							
Back and hip, flesh:									
.....	12	6	1				4		1
Perineum, genital and urinary organs:									
.....	1	1							
Shoulder:									
Flesh.....	6	2					4		
Fracture clavicle or scapula.....	2	1							
Arm:									
Flesh.....	18	8	12				7		
Fracture.....	4	5	12				1		
Elbow joint:									
.....	3	1					1		
Forearm:									
Flesh.....	7	2	4			1	3		
Fracture.....	3	3					12		
Hand, flesh:									
.....	8	1					7		
Carpus and metacarpus, fracture:									
.....	1	2	1						
Fingers, fracture:									
.....	1						1		
Thigh:									
Flesh.....	27	27	2				16	1	1
Fracture upper third.....	2	2	1				5		
Fracture middle third.....							1		
Fracture lower third.....	6	4					1		
Knee joint:									
.....	5						1		1
Leg:									
Flesh.....	15	11	3				6		
Fracture.....	4	6					1		
Ankle joint:									
.....		1							
Foot, flesh:									
.....	5	1	1				3		
Tarsus and metatarsus, fracture:									
.....	4	3	1				1		
Toes, fracture:									
.....		1							
Total	190	117	22	2		1	86	1	3

Gunshot wounds received in action—Continued.

VOLUNTEER ARMY, 1900.

Nature of missile.									Disposition.									
Brass cover of bullet.	Explosion of gun.	Fragment exploded bullet.	Explosion of powder.	Slugs.	Iron slug from cannon.	Shell.	Shrapnel.	One-pounder.	Total.	Duty.	Certificate of disability.	Died.	Discharged by order.	Expiration of service and muster out.	Missing in action.	Death, other causes.	Remaining last report.	Total.
		1		1					9 6	9 1	3	2						9 6
									10 5	9 2	1 2			1				10 5
									11 7	8	1 2	5	1					11 7
									20 25	20 11	5	8		1				20 25
									7 13	6 2	1	11						7 13
				1					3 24	1 23	1	1		1				3 24
									2	2								2
1									12 4	10 3	1 1			1				12 4
									35 13	27 4	5 7	2 1	1	1				35 13
					1				6	1	4	1						6
		1							18 9	17 3		6		1				18 9
1				1					17 4	16 3			1					17 4
									2	1	1							2
1		2			1				78 10	66 2	4 5	3 2	2 1	2	1			78 10
									11 7	1 3	9 2	1 1				1		11 7
									35 11	29 1	4 8		1 1	1 1				35 11
									10 9	9 2	1 2		2	2		1		10 9
									1	1								1
3		4		3	3				436	293	77	40	11	12	1	2		436

Gunshot wounds other than battle wounds.

REGULAR AND VOLUNTEER ARMIES, 1900.

Character and location of wounds.	How received.				Nature of missile.				
	In line of duty.	Not in line of duty.	Suicidal.	Homicidal.	Total.	Mauzer.	Remington.	Krag-Jørgensen.	Bullets not stated.
Head:									
Flesh	2	3	3	1	9			3	4
Fracture	5		1	1	7			4	2
Face:									
Flesh	5				5			1	1
Fracture	3	2			5			1	4
Neck	4	1			5			3	2
Thorax:									
Nonpenetrating	7	1	1		9			2	4
Penetrating	5	4	7	2	18			3	6
Abdomen:									
Nonpenetrating	8				8			2	3
Penetrating	5	2		1	8			3	2
Back and hip, flesh	13	2			15			5	5
Perineum, genital and urinary organs.	2	1			3			2	1
Shoulder:									
Flesh	10	3			13			3	7
Joint		1		1	2			1	1
Arm:									
Flesh	6	4			10			4	2
Fracture	1				1			1	4
Elbow joint	3				3			2	1
Forearm:									
Flesh	12	2			14			1	2
Fracture	5	2			7			5	2
Wrist joint	1				1				1
Hand, flesh	38	4			42	1		10	15
Carpus and metacarpus, fracture	15	4			19			10	6
Fingers, fracture	42	4			46			19	19
Thigh:									
Flesh	28	8		1	37			8	12
Fracture, upper third	1				1			1	1
Fracture, middle third	2				2			2	
Fracture, lower third	2				2				1
Knee joint	4	1			5			1	1
Leg:									
Flesh	26	1			27			4	3
Fracture	16	1			17			7	2
Ankle joint	2	1			3			3	
Foot, flesh	22	3			25		1	14	7
Tarsus and metatarsus, fracture	13	1			14			8	1
Toes, fracture	7	1			8			4	2
Total	315	57	12	7	391	1	1	135	111
									125

¹ Remaining in hospital June 30, 1901.² Remaining in hospital Apr. 30, 1901.

Gunshot wounds other than battle wounds.

REGULAR AND VOLUNTEER ARMIES, 1900.

Nature of missile.						Disposition.							
Small shot.	Percussion cap for dynamite shell.	Explosion of dynamite primer.	Explosion of cartridge.	Shell.	Total.	Duty.	Certificates of disability.	Died.	Discharged by order.	Mustered out.	Deserted.	Death, other causes.	Remaining last report.
					9	9							9
					7		3	4					7
			3		5	4	1						5
					5	4			1				5
					5	5							5
				1	9	8						1	9
					18	8	3	6					11
			1		8	8							8
					8	2		6					8
					15	14				1			15
					3	3							3
					13	11	1		1				13
					2		2						2
					10	10							10
					1	1							1
					3	1	1						3
2			1		14	13	1						14
					7	4	3						7
			3		1		1						1
					42	40		1					42
1	1	1			19	10	7					1	19
					46	35	8			1	2		46
1			1		37	36		1					37
					1	1							1
					2		1	1					2
					2			1					2
					5		3				1	1	5
					27	23	1		1	1			27
					17	11	3	1					17
					3		1	1					3
1					25	24							25
			1		14	7	7						14
					8	7	1						8
5	1	1	10	1	391	299	48	22	3	3	3	3	391

* Remaining in hospital May 31, 1901.

* Remaining in hospital May 31, 1901, and June 30, 1901.

Gunshot wounds other than battle wounds—Continued.

REGULAR ARMY, 1900.

Character and location of wounds.	How received.				Nature of missile.				
	In line of duty.	Not in line of duty.	Suicidal.	Homicidal.	Total.	Mauzer.	Remington.	Krag-Jørgensen.	Bullets not stated. Revolver.
Head:									
Flesh	2	2	3	1	8			2	4
Fracture	4		1	1	6			2	2
Face:									
Flesh	3				3				1
Fracture	2	12			14			1	3
Neck	2	1			3			1	2
Thorax:									
Nonpenetrating	5	1	1		7			1	3
Penetrating	3	3	6	2	14			3	4
Abdomen:									
Nonpenetrating	5				5			1	2
Penetrating	2	2		1	5			1	2
Back and hip, flesh	8	2			10			4	3
Perineum, genital and urinary organs	1				1			1	
Shoulder:									
Flesh	3	3			6			1	4
Joint				1	1			1	
Arm, flesh	4	2			6			3	1
Elbow joint	1				1				1
Forearm:									
Flesh	7	2			9				1
Fracture	1	1			2			1	1
Hand, flesh	18	3			21			4	8
Carpus and metacarpus, fracture	8	2			10			6	1
Fingers, fracture	19	3			22			5	11
Thigh:									
Flesh	19	8		1	28			4	11
Fracture, upper third	1				1			1	
Fracture, middle third	1				1			1	
Fracture, lower third	2				2				1
Knee joint	2	1			3				1
Leg:									
Flesh	12				12			1	2
Fracture	9	1			10			4	6
Ankle joint	1	1			2			2	
Foot, flesh	5				5			2	1
Tarsus and metatarsus, fracture	8				8			2	1
Toes, fracture	1	1			2				1
Total	159	41	11	7	218			55	66

¹ Remaining in hospital June 30, 1901.² Remaining in hospital Apr. 30, 1901.

Gunshot wounds other than battle wounds—Continued.

REGULAR ARMY, 1900.

Nature of missile.						Disposition.							
Small shot.	Percussion cap for dynamite shell.	Explosion of dynamite primer.	Explosion of cartridge.	Shell.	Total.	Duty.	Certificates of disability.	Died.	Discharged by order.	Mustered out.	Deserted.	Death, other causes.	Remaining last report.
					8		8						8
					6			3	3				6
			2		3		3						3
					4		3		1				4
					3		3						3
				1	7		6					1	7
					14		6	3	4				11
					5		5						5
					5		2	3					5
					10		10						10
					1		1						1
					6		6						6
					1			1					1
					6		6						6
					1							1	1
2			1		9		8	1					9
					2		1	1					2
			3		21		20						21
					10		5	4					10
1	1	1			22		17	4			1		22
1			1		28		27	1					28
					1		1						1
					1			1					1
					2			1					2
					3			2			1		3
					12		11						12
					10		6	2					10
					2				1				2
1					5		4						5
			1		8		4	4					8
					2		1	1					2
5	1	1	8	1	218	164	26	14	1		2	1	218

³ Remaining in hospital May 31, 1901.⁴ Remaining in hospital May 31, 1901, and June 30, 1901.

Gunshot wounds other than battle wounds—Continued.

REGULAR ARMY, 1900.

Character and location of wounds.	How received.					Nature of missile.				
	In line of duty.	Not in line of duty.	Suicidal.	Homicidal.	Total.	Mauzer.	Remington.	Krag-Jørgensen.	Bullets not stated.	Revolver.
Head:										
Flesh	2	2	3	1	8			2	4	2
Fracture	4		1	1	6			2	2	2
Face:										
Flesh	3				3				1	
Fracture	2				4			1		2
Neck:	12	1			13			1		2
Thorax:										
Nonpenetrating	5	1	1		7			1	3	2
Penetrating	3	3	6	2	14			3	4	7
Abdomen:										
Nonpenetrating	5				5			1	2	2
Penetrating	2	2		1	5			1	2	2
Back and hip, flesh	8	2			10			4	3	3
Perineum, genital and urinary organs.	1				1			1		
Shoulder:										
Flesh	3	3			6			1	4	1
Joint				1	1			1		
Arm, flesh	4	2			6			3	1	2
Elbow joint	1				1				1	
Forearm:										
Flesh	7	2			9				1	5
Fracture	1	1			2			1		1
Hand, flesh	18	3			21			4	8	6
Carpus and metacarpus, fracture	8	2			10			6	1	3
Fingers, fracture	19	3			22			5	11	3
Thigh:										
Flesh	19	8		1	28			4	11	11
Fracture, upper third	1				1			1		
Fracture, middle third	1				1			1		
Fracture, lower third	2				2				1	1
Knee joint	2	1			3				1	2
Leg:										
Flesh	12				12			1	2	9
Fracture	9	1			10			4		6
Ankle joint	1	1			2			2		
Foot, flesh	5				5			2	1	1
Tarsus and metatarsus, fracture	8				8			2	1	4
Toes, fracture	1	1			2				1	1
Total	159	41	11	7	218			55	66	81

¹ Remaining in hospital June 30, 1901.² Remaining in hospital Apr. 30, 1901.

Gunshot wounds other than battle wounds—Continued.

REGULAR ARMY, 1900.

Nature of missile.						Disposition.							
Small shot.	Percussion cap for dynamite shell.	Explosion of dynamite primer.	Explosion of cartridge.	Shell.	Total.	Duty.	Certificates of disability.	Died.	Discharged by order.	Mustered out.	Deserted.	Death, other causes.	Remaining last report.
					8	8							8
					6		3	3					6
			2		3	3							3
					4	3			1				4
					3	3							3
				1	7	6						1	7
					14	6	3	4					11
					5	5							5
					5	2		3					5
					10	10							10
					1	1							1
					6	6							6
					1		1						1
					6	6							6
					1								1
2			1		9	8	1						9
					2	1	1						2
			3		21	20							21
					10	5	4						31
1	1	1			22	17	4				1		31
					22								22
1			1		28	27		1					28
					1	1							1
					1			1					1
					2			1					31
					3		2			1			3
					12	11							31
					10	6	2						42
					2			1					31
1					5	4							21
			1		8	4							8
					2	1	1						2
5	1	1	8	1	218	164	26	14	1		2	1	10
													218

³ Remaining in hospital May 31, 1901.⁴ Remaining in hospital May 31, 1901, and June 30, 1901.

REPORT OF THE SECRETARY OF WAR.

Gunshot wounds other than battle wounds—Continued.

VOLUNTEER ARMY, 1900.

Character and location of wounds.	How received.				Nature of missile.				
	In line of duty.	Not in line of duty.	Suicidal.	Homicidal.	Total.	Mauzer.	Remington.	Krag-Jorgensen.	Bullets not stated. Revolver.
Head:									
Flesh		1			1			1	
Fracture	1				1				1
Face:									
Flesh	2				2			1	
Fracture	1				1				1
Neck	2				2			2	
Thorax:									
Nonpenetrating	2				2			1	1
Penetrating	2	1	1		4				2
Abdomen:									
Nonpenetrating	3				3			1	1
Penetrating	3				3			2	1
Back and hip, flesh	5				5			1	2
Perineum, genital and urinary organs.	1	1			2			1	1
Shoulder:									
Flesh	7				7			2	3
Joint		1			1				1
Arm:									
Flesh	2	2			4			1	1
Fracture	1				1			1	
Elbow joint	2				2			2	
Forearm:									
Flesh	5				5			1	1
Fracture	4	1			5			4	1
Wrist joint	1				1				1
Hand, flesh	20	1			21	1		6	7
Carpus and metacarpus, fracture	7	2			9			4	5
Fingers, fracture	23	1			24			14	8
Thigh:									
Flesh	9				9			4	1
Fracture, middle third	1				1			1	
Knee joint	2				2			1	1
Leg:									
Flesh	14	1			15			3	11
Fracture	7				7			3	2
Ankle joint	1				1			1	
Foot, flesh	17	3			20		1	12	6
Tarsus and metatarsus, fracture	5	1			6			6	
Toes, fracture	6				6			4	1
Total	156	16	1		173	1	1	80	45

Gunshot wounds which terminated fatally—Continued.

VOLUNTEER ARMY 1900.

Character and location of wound.	How received.						Nature of missile.						
	Not in action.						In action.						Not in action.
	In action.	In line of duty.	Not in line of duty.	Suicide.	Homicide.	Total.	Mauser.	Remington.	Bullet, not stated.	Brass cover of bullet.	Shell.	Shrapnel.	Krag-Jørgensen.
Head, fracture.....	12	1				3		2					
Neck.....	1					1		1					
Spine, fracture.....	25					5	3	1	1				
Thorax, penetrating.....	38	1	1			10	5	2	1				2
Abdomen, penetrating.....	411	3				14	3	5	3				2
Back and hip, flesh.....	31					1	1						1
Arm:													
Flesh.....	62					2		2					
Fracture.....	71					1		1					
Elbow joint.....	1					1		1					
Hand, flesh.....	91					1						1	
Thigh:													
Flesh.....	103					3	1	1	1				
Fracture, upper third.....	112					2			2				
Fracture, lower third.....	121					1		1					
Knee joint.....	131					1	1						
Leg, fracture.....	141					1							1
Ankle joint.....	151					1		1					
Total.....	40	7	1			48	14	18	8				4
													3
													1

¹ Small spiculae of bone removed in one case.² Tetanus in one case.³ Pneumonia in right lung, and gangrene in left lung in one case. Cartilage and bone removed.⁴ Septic infection in one case. Laparotomy in two cases, in one of which Murphy's button was used.⁵ Septicæmia.⁶ Brachial artery severed in one case. Amputation at shoulder in the other, with death from gangrene.⁷ Died of shock following amputation of shoulder joint.⁸ Amputation 3 inches above elbow joint.⁹ Tetanus.¹⁰ Septicæmia in one case. In another case, traumatic femoral aneurism and gangrene of foot. No remarks on third case.¹¹ Fragments bone removed; septic infection in one case. In the other, fragments bone removed with later excision of head of femur; died of septicæmia and shock.¹² Exhaustion following primary shock.¹³ Pyæmia.¹⁴ Amputation above knee; died of shock following operation.¹⁵ Amputation of lower third thigh for gangrene; collapse during operation.

Surgical work was reported in connection with 208 of these gunshot wounds; 171 of the patients recovered, 27 died, and 10 remained under treatment at latest reports. The discovery and removal of the missile was due to the use of the X-ray in 4 cases. Cartilage and bone were removed in 1 case of penetrating wound of the thorax which proved fatal, and in another, which was successful, a portion of the seventh rib was removed. Five laparotomies were performed, only 1 of which had a favorable termination. A fracture of the pelvis was reported in which two and a half months after the injury the wound was enlarged and a piece of drainage tube 5 inches long was removed. Amputation at the shoulder joint was performed in 4 cases, with only 1 recovery. The arm was amputated in 6 cases, 1 of which proved fatal; the forearm in 3 cases and parts of the hand in 50 cases, in 1 of which death occurred from chloroform narcosis. Amputation was performed at the hip joint in 1 case and disarticulation in 2 cases—all successful,

while 1 case of excision of the head of the femur was fatal from septicæmia. Five cases of amputation of the thigh were fatal, 7 recovered, while 1 remains under treatment. Four of these amputations of the thigh were for fractures of the leg, 1 for a flesh wound of the leg infected by the *bacillus aerogenes capsulatus*, 3 for fractures of the knee joint, 4 for fractures of the femur, and 1 for a flesh wound of the thigh in which the femoral artery was severed. Three of the deaths were from shock, 1 from sepsis, and 1 from chronic dysentery. One knee-joint amputation was successful. Seven amputations of the leg ended in recovery and 1 in death from septicæmia in a fracture of the ankle. Besides several resections and excisions the femoral artery was ligated in 3 cases, the brachial in 2 cases, and the posterior tibial in 1 case.

The details of this surgical work are given in the following table:

Surgical operations for gunshot wounds.

REGULARS AND VOLUNTEERS, 1900.

Character and location of wound.	Operation.	Result.		
		Recovered.	Died.	Remaining last report.
Head:				
Flesh	Skull trephined for traumatic acute diffuse meningitis.		1	
Fracture	Bullet located by X-ray and removed.	1		
Do	Fragments of bone removed.	2	2	
Do	Craniotomy for necrosis of skull.	1		
Do	Trephining.	1	2	
Face:				
Flesh	Enucleation of eye.	1		
Fracture	Bullet removed.	1		
Do	Bullet located by X-ray and removed.	1		
Do	Excision of sup. maxilla.	1		
Do	Fragments of bone removed.	1		
Do	Necrosis of bone removed.	1		
Spine, fracture	Pieces of jacket of cartridge removed.	1		
Thorax, penetrating	Bullet removed.	1		1
Do	Cartilage and bone removed.		1	
Do	Blood removed by aspiration.	1		
Do	Large quantities of blood and bloody fluid removed by aspiration September 28, October 10, and October 14; resection of 14 inches of right seventh rib October 17; large drainage tube inserted.	1		
Abdomen, penetrating	Laparotomy.		4	
Do	Celiotomy; abrasions in ileum sutured.	1		
Do	Bone curetted on 4 different occasions (wounded in 1899 in iliac region, penetrating abdomen).	1		
Pelvis, fracture	Carious bone curetted (wounded in 1899).	1		
Do	Sequestra removed from lower border right pelvic bone and fistulous tract cauterized.	1		
Do	Wound enlarged and denuded bone curetted.	1		
Do	Wound enlarged 24 months after date of wound and drainage tube 5 inches long found therein.	1		
Perineum, genital, and urinary organs.	Bullet extracted (wounded in 1899).	1		
Do	Testicle removed.	1		
Shoulder:				
Flesh	Bullet located by X-ray and removed.	1		
Fracture clavicle or scapula.	Fragments of bone removed.	1		
Do	Fragments of bone and part of brass shell covering of bullet removed.	1		
Shoulder joint.	Amputation at shoulder joint.		1	
Do	Fragments of scapula and bullet removed.	1		
Arm, flesh	Amputation at shoulder joint for gangrene.		1	
Do	Ligation of brachial artery.	2		
Do	14 inches of musculo-spiral nerve removed; ends brought together with fine silk sutures.	1		
Arm, fracture	Incision for liberation of musculo-spiral nerve from compression on fractured ends of bone.	1		
Do	Removal of fragments of bone.	1		1
Do	Removal of pieces of jacket of bullet pressing on nerve.	1		
Do	Removal of fragments of shell and bone.	1		
Do	Amputation at shoulder for gangrene.	1		
Do	Amputation at shoulder joint.		1	
Do	Amputation arm through upper third.	1		
Do	Operation for necrosis of humerus.	1		
Elbow joint	Bullet removed.	1		
Do	Fragments of bone removed.	1		1
Do	Fragments of bone removed July 3; arm amputated July 6 for infection.	1		
Do	Amputation of arm upper third July 13; flaps opened and drained July 17 for suppuration.	1		
Do	Amputation 3 inches above elbow joint.		1	
Do	Resection elbow joint.	2		
Do	Ankylosis fingers, wrist, and elbow broken up; fibrous union of humerus refractured.	1		
Forearm, fracture	Fragments of bone removed.	7		

¹ Died of traumatic acute diffuse meningitis.² Death from gangrene.

Surgical operations for gunshot wounds.

REGULARS AND VOLUNTEERS, 1900.

Nature of missile.											
Mausers.	Remington.	Krag-Jørgensen.	Mannlicher.	Bullets, not stated.	Revolver.	Slugs.	Shell.	Shrapnel.	Explosion of dynamite primer.	Percussion cap for dynamite shell.	One-pounder.
				1							
		1									
1	1			2			1				
				1	1		1				
					1						
	1				1		1				
1					1						
1					1						
1	1				1						
1											
2	1			1	1						
1					1						
1				1							
1				1							
	1										
	1										
				1							
1											
	1										
	1						1				
2	1										
1							1				
2											
1											
	1										
	1										
	1										
	1										
		1									
				1							
				2							
	1										1
	1										
		1									1
				1							
1		4		1	1						

*Died of shock following operation.

†Bullet 2½ inches long, made of scrap iron.

Surgical operations for gunshot wounds—Continued.

REGULARS AND VOLUNTEERS, 1900—Continued.

Character and location of wound.	Operation.	Result.		
		Recovered.	Died.	Remaining last report.
Forearm, fracture	Fragments of bone removed and ends of ulna and radius spliced and wired February 27; amputation April 17 above elbow for necrosis.	1		
Do	Fragments of bone removed and later resection of broken ends of radius and ulna.	1		
Do	Slugs removed on admission in January and 5 inches of radius removed in June.	1		
Do	Amputation of forearm.	2		
Do	Amputation above elbow May 1. Reamputation at junction of middle and upper thirds of humerus May 7. On account of supposed hæmophilia, tourniquet was left on arm, resulting in gangrene, and natural amputation at level of axilla. Remaining necrosed shaft of humerus and head removed July 5.	1		
Do	Resection of radius.	1		
Wrist joint	Amputation forearm; reamputation elbow joint.	1		
Hand, flesh	Amputation fingers.	2		
Carpus and metacarpus, fracture.	Amputation fingers and metacarpal bones.	3		
Do	Amputation fingers.	4	1	1
Do	Amputation arm.	1		
Do	Dead bone removed.	1		
Do	Necrosed bone curetted.	1		
Do	Portion of fourth metacarpal bone removed. Adhesions of joints second and third fingers broken up.			
Do	Amputation finger September 24, 1900. ¹			1
Do	Extensor tendon of third finger severed; 6 inches of exposed tendons of flexor sublimus digitorum, and flexors middle and index fingers excised. ²	1		
Fingers, fracture	Amputation fingers.	39		
Do	Projecting pieces of bone trimmed off.	1		
Hip joint	Removal of fragments of bone, bullet, and detached brass jacket.		2	
Thigh, flesh	Ligation of femoral artery.	2		
Do	Amputation at junction of middle and lower third thigh, bullet having severed femoral artery.	1		
Thigh, fracture upper third.	Dead bone removed.			1
Do	Ends of femur brought together and wired April 12. Disarticulation at hip May 28.	1		
Do	Fragments of bone and piece of bullet removed.	1		
Do	Piece of bone removed.	1		
Do	Removal of fragments of gunstock, lead, bullet jacket and bone December 18, 1900. ⁴	1		
Do	Removal of fragments of bone.		5	
Do	Removal of fragments of bone April 12; head of femur excised April 21.		6	
Thigh, fracture middle third.	Bullet removed.			1
Do	Fragments of bone removed.	1		
Do	Fragments of bone removed and marrow cavity curetted.		7	
Do	Amputation at hip joint (wounded in 1899).	1		
Do	Amputation upper third thigh.		8	
Do	Amputation for gangrene.	1		
Thigh, fracture lower third.	Carious bone removed.	2		
Do	Fragments of bone removed.	2		
Do	Fragments of bone removed in March and May; necrosed bone curetted October 26; amputation upper third thigh November 24.	1		
Do	Bullet and fragments of bone removed March 27; wounds incised and pus removed May 26.	1		
Do	Amputation lower third thigh.		9	
Do	Removal of 1½ inches of lower fragment of femur.	1		
Knee joint	Bullet removed.	2		
Do	Fragments of bone and dead tissue removed.	1		
Do	Fragments of bone, bullet, and shell removed.	1		

¹ Died of chloroform narcosis.² Wrist amputation in 1901.³ Septic infection.⁴ Disarticulation of femur, for sepsis, 1901.

Surgical operations for gunshot wounds—Continued.

REGULARS AND VOLUNTEERS, 1900—Continued.

Nature of missile.											
Mauzer.	Remington.	Krag-Jörge- sen.	Mannlicher.	Bullets, not stated.	Revolver.	Slugs.	Shell.	Shrapnel.	Explosion of dynamite primer.	Percussion cap for dynamite shell.	One-p under.
						1					
	1					1					
	2	1									
1				1							
		2		1	1						
		3		1	2						
1	1										
		1						1			
	1										
	1										
		16		18	3				1	1	
	1	1									
2											
	1										
	1										
	1										
		1		1							
				1							
1				1							
	1										
1		1									
	1										
	1	1									
	1	2									
1											
	1										
				1							
				1	2						
1											

* Died of septic infection.

* Died of septicæmia and shock.

† Died of septicæmia.

* Died of shock following operation.

Surgical operations for gunshot wounds—Continued.

REGULARS AND VOLUNTEERS, 1900—Continued.

Character and location of wound.	Operation.	Result.		
		Recovered.	Died.	Remaining last report.
Knee joint	Piece of shell removed		¹ 1	
Do	Fragments of bone removed May 11; amputation upper third thigh July 20.		² 1	
Do	Amputation through knee joint	1		
Do	Amputation middle third thigh	1	² 1	
Leg, flesh	Amputation middle third thigh for bacillus capsulatus.	1		
Do	Bullet located by X-ray and removed	1		
Do	Femoral artery ligated for popliteal aneurism	1		
Leg, fracture	Bullet removed	1		
Do	Fragments of bone removed	5		
Do	Fragments of bone removed and marrow cavity curetted.			1
Do	Removal of bone and several pieces of metal	1		
Do	Fragments of bone removed April 22; carious bone removed May 28.			1
Do	Amputation below knee	3		
Do	Amputation lower third thigh for osteitis.			1
Do	Amputation above knee		⁴ 1	
Do	Amputation leg July 2; amputation middle third thigh Nov. 3.	1		
Do	Amputation thigh, junction lower and middle thirds, December 18, 1900. 1 inch more removed February 8, 1901.	1		
Do	Ends of fragments of bone freshened and a portion removed from upper fragment and placed in apposition.	1		
Do	Resection of fibula	1		
Ankle joint	Amputation of leg.		⁵ 1	
Do	Amputation lower third thigh for gangrene		⁶ 1	
Tarsus and metatarsus, fracture.	Bullet removed	1		
Do	Fragments of bone removed	2		
Do	Fragments of bone and eyelet of shoe removed.	1		
Do	Amputation of leg for gangrene	1		
Do	Amputation of toe	1		
Do	Secondary amputation junction lower and middle third leg.	1		
Do	Fragments of bone removed April 12; remainder third metatarsal bone removed April 21; amputation of leg April 23 to save life.	1		
Do	Ligation of posterior tibial artery for secondary hemorrhage.	1		
Toes, fracture	Amputation toes	7		
Do	Dead bone removed	1		
Do	Shattered phalanx curetted and spiculae removed	1		
Total		171	27	10

¹ Died of septic arthritis, knee.² Died of sepsis and exhaustion.³ Died of chronic dysentery.

Surgical operations for gunshot wounds—Continued.

REGULARS AND VOLUNTEERS, 1900—Continued.

Mausers.	Remington.	Krag-Jörgensen.	Nature of missile.										One-pounder.	Iron slug from cannon.	Explosion of cartridge.
			Mannlicher.	Bullets, not stated.	Revolver.	Slugs.	Shell.	Shrapnel.	Explosion of dynamite primer.	Percussion cap for dynamite shell.					
								1							
	1														
	1			1				1							
		1													
1															
1															
1	1	1		2	1										
							1								
		1	1												
1		1					1								
		1		1											
	1														
		1													
				1											
	1														
	1	1		1											
1		1	1												
	1														
	1	1													
		1			1										
		1													
		5		1	1										
				1											
					1										
34	40	48	2	49	18	2	7	3	1	1		1		1	

* Died of shock following operation.

* Died of septicæmia.

* Collapse during operation.

Besides the gunshot wounds received in action, the battle casualties of the year included 41 men killed and 83 men wounded, mostly by the bolo, kris, or spear. Five of the 83 wounded died of their wounds.

Killed in action, caused by wounds other than gunshot.

REGULARS AND VOLUNTEERS, 1900.

Character and location of wounds.	Regulars.	Volunteers.					Total regulars and vol- unteers.
	Bolo.	Bolo.	Dagger.	Spear.	Kris.	Total.	
Head, fracture	3	7				7	10
Neck		3			1	4	4
Thorax, penetrating		7	1	1		9	9
Abdomen, penetrating		4		1		5	5
Shoulder		1				1	1
Unknown	2	10				10	12
Total	5	32	1	2	1	36	41

Wounds other than gunshot received in action.

REGULARS AND VOLUNTEERS, 1900.

Character and location of wounds.	Weapon.									Disposition.						
	Bolo.	Dagger.	Spear.	Bamboo spear.	Lance.	Arrow.	Heated arrow.	Club.	Rock.	Total.	Duty.	Certificates of disability.	Died.	Order.	Muster out.	Remaining last report.
Head:																
Flesh	3							1	1	5	5					
Fracture	5									5	1	1	1	1		1
Neck	1									1			1			
Thorax:																
Nonpenetrating	3						1			4	4					
Penetrating	2			1						3	1		1		1	
Abdomen:																
Nonpenetrating	1			1						2	2					
Penetrating	1	1								2			2			
Back and hip, flesh	6			1						7	6			1		
Shoulder:																
Flesh	4									4	4					
Joint	1									1		1				
Arm:																
Flesh	3	2		1						6	3	3				
Fracture	1									1		1				
Forearm:																
Flesh	5	1		3						9	9					
Fracture	1									1		1				
Hand, flesh	8		1	2						11	11					
Carpus and metacarpus, fracture	2									2	1	1				
Fingers, fracture	3									3	3					1
Thigh, flesh	2		1	6						9	8				1	
Knee joint	1				1					2		1				
Leg, flesh	2			1		2				5	5					
Tarsus and metatarsus, fracture	1									1	1					
Total	55	4	2	16	1	2	1	1	1	83	63	9	5	2	2	2

¹ Pieces of bone removed.

² Skull trephined. Remaining in hospital May 31, 1901.

³ In one case, bulbous swelling on musculo-spiral nerve excised and nerve sutured. In another case, injured portion musculo-spiral nerve resected, ends sutured, and ends of severed biceps muscle fastened and sutured. In another case, amputation at shoulder joint for gangrene, brachial artery having been severed.

⁴ Arm amputated.

⁵ In one case, finger amputated.

⁶ Remaining in hospital March 31, 1901.

Wounds other than gunshot received in action—Continued.

REGULARS, 1900.

Character and location of wounds.	Weapon.								Total.	Disposition.						
	Bolo.	Dagger.	Spear.	Bamboo spear.	Lance.	Arrow.	Heated arrow.	Club.		Rock.	Duty.	Certificates of disability.	Died.	Order.	Muster out.	Remaining last report.
Head:																
Flesh									1	1	1					
Fracture	1									1						1
Thorax:																
Nonpenetrating	1									1	1					
Penetrating				1						1		1				
Abdomen:																
Nonpenetrating	1									1	1					
Penetrating		1								1		1				
Shoulder, flesh	1									1	1					
Arm, fracture	1									1		1				
Forearm, flesh	1									1	1					
Fingers, fracture	2									2	1					1
Thigh, flesh	1			2						3	3					
Knee joint					1					1		1				
Leg, flesh	1					1				2	2					
Tarsus and metatarsus, fracture	1									1	1					
Total	11	1		3	1	1			1	18	12	2	2			2

VOLUNTEERS, 1900.

Head:																
Flesh	3								1	4	4					
Fracture	4									4	1	1	1	1	1	
Neck	1									1			1			
Thorax:																
Nonpenetrating	2						1			3	3					
Penetrating	2									2	1				1	
Abdomen:																
Nonpenetrating				1						1	1					
Penetrating	1									1			1			
Back and hip, flesh	6			1						7	6			1		
Shoulder:																
Flesh	3									3	3					
Joint	1									1		1				
Arm, flesh	3	2		1						6	3	1				
Forearm:																
Flesh	4	1		3						8	8					
Fracture	1									1		1				
Hand, flesh	8		1	2						11	11					
Carpus and metacarpus, fracture	2									2	1	1				
Fingers, fracture	1									1	1					
Thigh, flesh	1		1	4						6	5				1	
Leg, flesh	1			1		1				3	3					
Total	44	3	2	13		1	1	1		65	51	7	3	2	2	

¹Skull trephined. Remaining in hospital May 31, 1901.²Arm amputated.³Finger amputated.⁴Remaining in hospital March 31, 1901.⁵Pieces of bone removed.⁶In one case, bulbous swelling on musculo-spiral nerve excised and nerve sutured. In another case, injured portion musculo-spiral nerve resected, ends sutured and ends of severed biceps muscle fastened and sutured. In another case, amputation at shoulder joint for gangrene, brachial artery having been severed.

Special surgical reports, rendered to June 30, 1901.

Name.	Rank.	Reports.
Baird, W. T.	Contract surgeon	Adenitis, incision.
Banister, J. M.	Major and surgeon	Report on the radical cure of varicocele. ¹ Operations for the radical cure of hernia, 5 cases.
Block, W. H.	Contract surgeon	Operations for the radical cure of hernia.
Borden, W. C.	Major and surgeon	Operations for the radical cure of hernia, 41 cases. Report on the radical cure of varicocele. ¹ Operations for the radical cure of hernia, enlisted men of the United States Navy. Popliteal aneurism.
Bradley, A. E.	Captain and assistant surgeon.	Operations for the radical cure of hernia, 4 cases. Varicocele. Appendicitis. Tubercular testicle. Report on the radical cure of varicocele. ¹
Calhoun, Wm. H.	Contract surgeon	Gunshot wound of chest, suicide.
Carling, John.	First lieutenant and assistant surgeon.	Gunshot wound of head.
Carr, L. C.	Major and surgeon volunteers.	Operation for the radical cure of hernia, 2 cases.
Corbuser, W. H.	Major and surgeon	Appendicitis.
Darnall, C. R.	First lieutenant and assistant surgeon.	Amoebic abscess of liver, 4 cases. ² Gangrenous inflammation of Meckel's diverticulum. ³ Report of surgical operations hospital ship Relief.
DeMey, C. F.	Contract surgeon	Incised wound of the neck, severe.
Fauntleroy, P. C.	First lieutenant and assistant surgeon.	Operation for the radical cure of hernia. Abscess of liver.
Flagg, Charles E. B.	Captain and assistant surgeon.	Amputation of the umbilical cord at the skin margin. Histories of cases operated on since June, 1900. Description of operation for hemorrhoids. Operation for varicocele, 3 cases. Report of surgical operations during year ending June 30, 1901.
Frick, E. B.	do	Operation for the radical cure of hernia.
Girard, A. C.	Lieutenant-colonel and deputy surgeon-general.	Report of surgical operations for period ending Apr. 30, 1900. Report of surgical operations, 27 cases. Report of surgical operations, September to December, 1900. Report on the radical cure of varicocele. ³ Report of surgical operations, Nov. 30, 1900, to Feb. 28, 1901. Operation for the radical cure of hernia. Report of surgical operations during March, April, and May, 1901.
Hallock, H. M.	Captain and assistant surgeon.	Removal of abdominal tumor, fibro-sarcoma.
Howard, D. C.	do	Septic arthritis, multiple incision and tube drainage. Operation for the radical cure of hernia, 2 cases. Rupture of spleen. ⁴ Operation for varicocele, 5 cases. Traumatic neuritis, neurectomy, and nerve suture.
Keefer, F. R.	do	Drowning.
Kendall, W. P.	Major and surgeon	Septicemia.
Kennedy, J. S.	Contract surgeon	Fracture of skull. Operation for the radical cure of hernia. Gunshot wound of chest.
Kilbourne, H. S.	Major and surgeon	Laryngeal stenosis.
Leeper, Matthew	Contract surgeon	Prostatitis, cystitis, and urethral fistula.
Lyster, Theo. C.	First lieutenant and assistant surgeon.	Lumbar abscess.
Metcalf, B. H.	Contract surgeon	Abscess of lung.
Neff, Wallace.	Major and surgeon volunteers.	Femoral aneurism.
Perley, H. O.	Major and surgeon	Report of surgical operations on hospital ship Relief, Jan. 1 to May 31, 1900.
Phillips, John L.	do	Intestinal obstruction, laparotomy.
Ramsey, George D.	Contract surgeon	Gangrenous appendicitis.
Rhoads, T. L.	do	Appendicitis.
Shimer, Ira A.	First lieutenant and assistant surgeon.	Operation for the radical cure of hernia.
Stark, A. N.	Captain and assistant surgeon.	Traumatic rupture, middle meningeal artery. Compound depressed fracture of skull. Strangulated femoral hernia. Operation for radical cure of hernia.
Stone, J. Hamilton	First lieutenant and assistant surgeon.	Perineal urethrotomy. Operation for the radical cure of hernia, 4 cases. Fistula in ano.
Whittington, W. L.	Contract surgeon	Enucleation of eye.
Woodruff, C. E.	Major and surgeon	Gunshot wound of thigh, amputation. Operation for the radical cure of hernia.

¹ Published in Circular No. 3, Surgeon-General's Office, 1901.² Published in the New York Medical Journal, February 9, 1901.³ Published in Circular No. 3, Surgeon-General's Office, 1901.⁴ Published in the Philadelphia Medical Journal, March 11, 1901.

A report on the use of the Röntgen ray by the Medical Department of the United States Army in the war with Spain, prepared under my direction by Capt. W. C. Borden, assistant surgeon (now major and surgeon), United States Army, was received from the Government Printing Office in January, 1901, and has since been distributed. Experience with the use of the Röntgen ray apparatus leads Major Borden to the conclusions that its use in movable hospitals is not advisable and that it should be restricted to permanent base and general hospitals. His reasons for this are: First, that lodged bullets require immediate removal only in extremely rare instances; second, that the environment of and conditions incident to movable field hospitals render asepsis in operating practically impossible, and in consequence in field hospitals noninterference with wounds should be practiced to the utmost extent possible; third, that surgical interference with lodged bullets, except where adequate asepsis is available or the necessity urgent, is to be condemned, as the suppuration which follows is much more detrimental to the patient than the presence of the lodged missile; fourth, that a Röntgen ray apparatus in the field is an additional incentive to surgeons to operate under conditions not adequately aseptic. The report shows clearly that in noninfected wounds extensive comminution of bone is not as a rule an indication for operative intervention; that where there is infection, complete cleansing of the wound and removal of all loose bone fragments, followed by drainage, antiseptic dressings and irrigation, usually suffice, and that excision or amputation is to be resorted to only in extreme cases.

ABSTRACTS FROM THE RECORDS OF THE ARMY HOSPITAL SHIP RELIEF, SUBMITTED MARCH 12, 1901.

[Operations by First Lieut. Carl R. Darnall, assistant surgeon, United States Army.]

Amputation at elbow joint for osteomyelitis of radius and ulna, following amputation of forearm.—E. J. O., private, Company A, Twenty-eighth Infantry, United States Volunteers; age, 21; native of Pennsylvania; admitted to *Relief* June 11, 1900, from regimental hospital at Taal, Luzon, P. I. History: This man was wounded in left wrist on May 30, 1900, accidentally. The damage done was so great that the regimental medical officer amputated through the lower third of the forearm. The wound became infected, and when received on the *Relief* his temperature was high, ranging from 102° to 105° F., and his condition was bad. There was acute osteomyelitis of ulna and radius in the stump. I disarticulated at the elbow joint June 12, 1900. Recovery uneventful, union being primary.

Amputation of thigh for compound gunshot fracture of tibia and fibula.—H. G. D., private, Company M, Fourteenth United States Infantry; age, 34; native of Ireland; admitted to *Relief* September 4, 1900, from United States general hospital, Tientsin, China. History: On August 15, 1900, at Pekin, was wounded in left leg. Bullet entered at internal surface at junction of upper and middle third. It passed outward and backward, fracturing and badly comminuting tibia. Fibula also was fractured. The wound was infected when he was admitted to this ship, and pus had burrowed upward and downward between the muscles. An attempt was made to save the limb by opening up all the pockets and making counter openings in several places for through and through drainage. His condition remained fairly good, but there was very free discharge of pus. On November 13, thirteen weeks after the injury, I decided to amputate, as he was gradually growing weaker, and the ship being ordered to Manila it was thought advisable to perform the operation before returning to the Tropics. I made a long anterior and short posterior flap, dividing the femur above the condyles, as without this flaps of sufficient length could not be obtained. The wound healed by primary union, recovery being rapid and uneventful.

Amputation of thigh for tuberculosis of knee.—L. H. S., private, G, Sixth United States Artillery; age, 24; native of Indiana; admitted to *Relief* December 28, 1900, from post hospital at Cebu, P. I. History: On September 25 had an attack of acute pleurisy, right side. About October 18 an arthritis of left knee developed. The joint

became greatly swollen and tender and opened spontaneously about November 3. All the tissues became greatly thickened. The joint was completely disorganized, and the patient became much emaciated. He had hectic fever and night sweats. The limb both above and below the joint became riddled with sinuses. When admitted to the *Relief* his condition was extremely bad. He was a mere skeleton and had high fever every evening. A diagnosis of tubercular disease had been made. His lungs and other organs seemed unaffected, and on January 3, 1901, I amputated, dividing the bone at junction of upper and middle thirds of thigh. Shock was quite severe, but that having been overcome he had no further trouble. The wound healed by primary union, and on the twentieth day after operation his general condition was so much improved that he was able to be about on crutches. He rapidly regained his strength, and recovery is apparently complete.

Periostitis of femur.—G. B., private, Company C, First United States Infantry; age, 19; native of Pennsylvania; admitted to *Relief* December 7, 1900, from military hospital, Catbalogan, Samar, P. I. Diagnosis on transfer slip: Acute arthritis left knee. History: While on an expedition about October 15, 1900, he first noticed pain and stiffness on inner side of middle of left thigh. This extended downward to just above knee. This pain gradually increased and was worse at night. On admission to *Relief* he had a temperature of 98.8° in evening. There was pain and stiffness of knee and deep fusiform swelling involving middle third of thigh. This seemed to be connected with the bone. The knee joint was not swollen and appeared to be uninvolved. On December 17, 1900, I operated, making a long incision on outer surface of thigh over the deep swelling and discovered a condition of extensive periostitis. This was tubercular in character. After cleaning out thoroughly and making counter openings to procure free drainage the wounds were packed with gauze. At present, February 15, his condition is much improved, and the prospect for complete recovery is excellent.

Anarhic abscess of liver.—H. A. C., private, Company I, Sixth United States Infantry. Age, 21. Native of Kentucky. Admitted to *Relief* December 24, 1900, from United States hospital at Dumaguete, Negros, P. I. Diagnosis on transfer slip: Anemia, acute. History: Had dysentery in 1899. Was in good health after this until September, 1900, when present trouble began. He first noticed pain just below costal border on right side, this radiated upward to the right shoulder. He had occasional attacks of nausea and vomiting. He had fever in evening and began to lose flesh. When admitted to the *Relief* his temperature was irregular, rising to 102° or 103° in evening, followed by sweats at night. The liver dullness was increased upward and downward. An exploratory puncture was made on December 27, and pus discovered in convexity of right lobe. I operated the same day by the transpleural method, removing 3 inches of ninth rib in axillary line. The diaphragmatic was stitched to the costal pleura. The liver was found to be not adherent to the diaphragm. A free opening was made into the abscess, which was situated about 1 inch below surface. Twelve hundred and fifty cubic centimeters of pus was evacuated. The anterior part of the wound through chest wall and diaphragm was closed, and a large drainage tube brought out of the posterior angle. The patient made an uneventful recovery. Discharge ceased one month after operation.

Operation for varicocele by the high method.—A. A. S., private, Company K, Fortieth Infantry, United States Volunteers. Age, 27. Native of Canada. This operation was performed December 27, 1900, at Cebu, P. I. An incision 1½ inches long was made over cord downward from the external ring. The veins were separated from the vas deferens and drawn out of the incision. Ligatures were placed about the veins above and below, and the portion of the vessels included between the ligatures (about 2 inches) was removed. The ends of the ligatures, which had been left long, were then tied together, thus lifting the testicle and shortening the cord. Stitches were inserted and a capillary drain used for twenty-four hours, after which the incision was sealed by collodion.

Operation for acute gangrenous appendicitis.—G. D. B., private, Company A, Thirtieth United States Volunteers. Age, 22. Native of Michigan. Admitted to *Relief* January 25, 1901, from United States hospital, Lucena, Luzon, P. I. History: This patient had an attack of pain in right iliac region, associated with fever and vomiting, about nine months ago. Since that time has been well until present attack. On January 24, 1901, was suddenly taken with pain in abdomen, gradually becoming localized in right iliac region. When admitted to the *Relief* he had a temperature of 99.4° F., occasional vomiting, and marked tenderness in right iliac region, and rigidity of right rectus. The pain was increased by extension of right thigh. Operation was performed January 26, by an oblique incision. There were numerous old adhesions, imbedded in which was the appendix in a state of gangrene. The parts were so firmly tied down that in order to get sufficient room the original incision was

extended. The appendix was ligated near its base and removed. Drainage by rubber tube and gauze was made. The patient took the anæsthetic very badly, and broncho-pneumonia set in on January 27. There was a considerable discharge of pus through the drainage tube for about a week, after which it gradually decreased in amount. The pneumonia, after several days, rapidly improved, and from this time recovery was uneventful.

Operation for the radical cure of hernia (Bassini's method).—C. B., private, Company C, Forty-fifth Infantry, United States Volunteers. Age, 24. Native of Indiana. Admitted to *Relief* January 29, 1901, from post hospital at Nueva Caceres, Luzon, P. I. The hernia in this case appeared about eight months ago. It was a complete, oblique inguinal hernia, left side. This operation presented no peculiar features. Kangaroo tendons used for deep sutures. Recovery uneventful. Union primary.

Operation for varicocele by the high method.—J. B. M., private, Company C, Forty-fifth Infantry, United States Volunteers. Age, 27. Native of District of Columbia. Admitted to *Relief* January 29, 1901, from post hospital, Nueva Caceres, Luzon, P. I. This case presented no peculiarities. Union was primary and recovery uneventful.

Suprapubic cystotomy for vesical calculus.—J. B., private, Company H, Forty-seventh Infantry, United States Volunteers. Age, 28. Native of Pennsylvania. Admitted to *Relief* January 27, 1901, from post hospital at Sorsogon, Luzon, P. I. History: In 1895 the patient first began to have trouble with his urinary apparatus. At that time he had to get up at night to pass water. He gives a history of renal colic. The active symptoms manifested themselves about a year ago. He had some pain in back and passed bloody urine at times. He has had increased frequency of micturition, stopping of the flow, pain after urination, etc. He was admitted to the *Relief* with a diagnosis of chronic cystitis. His urine was alkaline and foul smelling. On passing a sound a large stone was discovered. On February 7, 1901, I performed the suprapubic operation and removed a large calcium oxalate stone, which measured about 2½ inches in its longest diameter, and in its shortest diameter about 1½ inches. It weighed 92 grams. Specimens of calcium oxalate stones of this size must be very rare; therefore I have sent this to the Army Medical Museum. The operation presented no unusual features except, of course, the large incision in the bladder for the removal of the stone. At present the patient is doing well and the cystitis is rapidly improving. The wound in the bladder is not sutured. Capillary drainage with gauze.

Operation for abscess of liver.—C. O'D., private, Company K, Fortieth Infantry, United States Volunteers. Age, 23. Native of Ireland. Admitted to *Relief* February 9, 1901, from United States hospital at Cagayan, Mindanao, P. I. Diagnosis on transfer slip: Acute hepatitis following dengue. History: This patient states that he was feeling well until February 4, 1901, at which time he was taken with nausea, vomiting, gradually increasing pain and tenderness in the epigastrium, and fever. When admitted he had a temperature of 102° F. in evening; pulse about 100; skin hot and dry; occasional vomiting. There was considerable dullness, and the patient's condition was very like the third week of a severe case of typhoid, with the exception of the pulse, which was below 100. There was a prominence of the epigastric region. I operated on February 10, making a median incision 2½ inches long through the abdominal wall just below the ensiform cartilage. On finding the liver adherent, I incised it and evacuated about 1,000 cubic centimeters of pus from the left lobe. Washed out cavity thoroughly and drained with two large tubes. The patient at present, February 16, is not doing very well. His temperature remains high, and signs of pyæmia are more marked. There are probably other collections of pus not yet discovered.

Notice: This patient died on February 28, 1901. Autopsy showed large abscesses of left lobe of liver, extending for a considerable distance into right lobe. The under surface of liver was adherent to anterior surface of stomach near pylorus. Spleen enlarged and softened. The other abdominal organs were apparently normal. Pericardium contained two ounces of clear straw-colored fluid. Both lungs were bound down to chest wall by old adhesions. Upper lobe of left lung was the site of numerous small abscesses.

Operation for radical cure of hernia (Bassini's method).—A. B. B., corporal, Company F, Thirty-first Infantry, United States Volunteers. Age, 23. Native of Ohio. Admitted to *Relief* February 8, 1901, from military hospital at Zamboanga, Mindanao, P. I. Operation February 11, 1901. This was a case of recent hernia. The operation presented no special features. Kangaroo tendon used for deep sutures. Union primary.

C. M. T., private, Company H, Thirty-first Infantry, United States Volunteers. Age, 30. Native of Kentucky. Operation February 11, 1901. This hernia was incurred in October, 1900. The neck of the sac was large. The operation presented nothing special. Kangaroo tendon used for deep sutures. Union primary.

ABSTRACTS FROM THE RECORDS OF THE UNITED STATES ARMY GENERAL HOSPITAL,
FERNANDO OF SAN FRANCISCO, CAL.

The following table of operations and results comprises the surgical work performed at this hospital during the past fiscal year. In addition to the usual records kept in such cases, a surgical report of each operation is forwarded to the Surgeon-General, and a complete clinical history, with a copy of the surgical report, is kept on file in this hospital. All of the operative work has been performed by the commanding officer of the hospital. A short review of the surgical work may be of interest.

Total number of surgical cases admitted to the ward during the fiscal year has been 372, divided as follows:

Regulars.....	187
Volunteers.....	153
Discharged soldiers.....	15
Civilians.....	17
Total.....	372

There have been 194 surgical operations performed by the commanding officer during the year, divided as follows:

Regulars.....	90
Volunteers.....	73
Discharged soldiers.....	14
Civilians.....	17
Total.....	194

The following is a tabulated list of the operations and results:

Operation and character.	Total.	Recov- ered.	Died.	Remarks.
Abscess:				
Hepatic.....	3	3		
Ischio-rectal.....	1	1		
Adenitis, nontubercular.....	1	1		
Appendicitis:				
Acute.....	1	1		
Recurrent.....	19	19		
Amputation:				
Right thigh.....	1	1		
Large toe, right.....	2	2		
Third finger, right.....	2	2		
Right leg, conical stump.....	1	1		Reamputation.
Left leg, upper third.....	1	1		
Aneurysm:				
Popliteal.....	1	1		Result of gunshot wound left leg.
With varix, left temporal.....	1	1		
Cartilage displaced, right knee.....	1	1		
Contraction, palmar fascia.....	1	1		
Empyema:				
Sequel of gunshot wound.....	1	1		Wound received in 1877.
Sequel of pneumonia.....	7	6	1	
Enucleation, 2 of right eye and 1 of left eye.....	3	3		
Fistula in ano.....	5	5		
Fracture, simple faulty union.....	3	3		
Hernia:				
Inguinal.....	35	34	1	Cause of death, oedema and congestion of lungs. Pa- tient had just completed an extended spree, which was not known.
Ventral.....	5	5		
Hemorrhoids:				
External.....	8	8		
Internal.....	4	4		
Internal and external.....	8	8		
Hydrocele, tapping and injection.....	1	1		
Hammer toe, tenotomy.....	1	1		
Intestinal adhesions, laparotomy.....	2	2		
Ingrowing nail, removal with matrix.....	5	5		
Laparotomy, exploratory.....	1	1		
Mastoiditis, trephining mastoid.....	2	2		
Nerve stretching; median nerve, right; sciatic nerve, left.....	2	2		
Phimosis, circumcision.....	5	5		
Tumors:				
Lipoma.....	2	2		
Fibroid.....	1	1		

Operation and character.	Total.	Recovered.	Died.	Remarks.
Tumors:				
Cysts, sebaceous	1	1		
Carcinoma of larynx.....	1		1	Tracheotomy performed; died about three weeks later from broncho-pneumonia.
Varicocele:				
Left, single	30	30		
Double.....	1	1		
Wounds:				
Gunshot	16	16		
Incised.....	1	1		
Varicose veins, legs.....	4	4		
Stricture, rectum	1	1		
Tonsils, tonsilotomy for hypertrophy.....	1	1		
Total.....	194	191	3	

ABSCESS OF THE LIVER.

Three operations for this condition were performed, all of which recovered. In no case was the amoeba of dysentery found, and in two cases there was no evidence of the previous existence of dysentery. In one case, that of a recruit, the patient had never been out of the United States.

S. A., private, Battery L, Third Artillery.—Patient was admitted to this hospital on December 11, 1900, from the Philippine Islands, and was found to have a small fluctuating tumor upon the right side of the abdomen. This was only slightly tender and gave very little discomfort. He gave a history of having had malaria in the Philippine Islands, but said that he had never had dysentery or diarrhea. After a few days the tumor was found to be increasing slightly in size, and he had some rise of temperature in the evening. There was no jaundice or disturbance of the bowels.

Operation December 25, 1900: An incision was made over the most prominent part of the tumor in the abdominal wall just below the margin of the ribs. Quite a large amount of pus was found which was apparently confined to a localized area between the muscles. The discharge from the wound, however, was very profuse during the next few days, and while the wound was being dressed, about a week after the operation, a small sinus was found just below the margin of the ribs, leading beneath the abdominal wall. This was enlarged and found to communicate with a large abscess cavity involving the lower portion of the right lobe of the liver. This cavity was irrigated and drained, and the patient made a rapid recovery, being discharged on February 26, 1901, in good condition, the wound entirely healed.

E. J. O'N., private, Company K, Forty-second Volunteer Infantry.—The patient was admitted to this hospital on March 1, 1901, complaining of pain over the region of the liver and the lower portion of the right chest. This pain had been present since December, 1900. There was some evening temperature daily and a slight cough. Upon auscultation, the lower portion of the right chest was found flat and the voice and breathing sounds absent. He gave a history of having had dysentery in the Philippine Islands in July, 1900. Examination of the sputum for tubercle bacilli gave a negative result. An aspirating needle, introduced in the eighth interspace in the posterior axillary line, withdrew bloody pus.

Operation March 20, 1901: About 2 inches of the eighth rib was removed in the posterior axillary line. Immediately beneath this was found an abscess cavity about the size of a large orange, filled with thick bloody pus. This was shut off from the pleural cavity and extended along the diaphragm for some distance. It was thought that it communicated with the upper surface of the liver, although no opening could be found. The abscess cavity was irrigated and a drainage tube inserted. After the operation the wound healed readily and the patient was discharged from the hospital on April 22, 1901, with the wound entirely healed.

H. S., private, Twenty-eighth Company Coast Artillery.—Patient was admitted to this hospital on March 13, 1901, complaining of pain and tenderness over the right side of the abdomen. The patient was a recruit and had never been outside of the United States. He stated that these symptoms had been present for about a month. The bowels were constipated and there was an evening rise of temperature. He denied ever having had dysentery or other serious illness prior to the onset of the symptoms mentioned.

Operation March 22, 1901: An aspirating needle was introduced into the right side a little below the margin of the ribs, and revealed the presence of pus.

An incision was made through the abdominal wall at this point and a large abscess cavity opened, which extended upward beneath the lower surface of the liver and involved the right lobe. This cavity was irrigated and a drainage tube inserted.

Improvement was rapid after the operation and the patient was discharged from the hospital, the wound being entirely healed.

APPENDICITIS.

Nineteen operations for appendicitis were performed, recovery taking place in all the cases.

The technique of the operation has been somewhat modified by invaginating the stump of the appendix, the use of the gridiron incision, and the reduction in length of the skin incision, which in these cases has not been over three to four centimeters. The danger of hernia from this mode of operating is very much reduced and no case of such character has occurred.

The technique of the operation is improved by invaginating the stump of the appendix and covering in the invagination with a purse string suture of the bowel surrounding it. Further protection of the stump is obtained by a second suture surrounding the previous suture and about two-thirds of a centimeter beyond it. This double invagination, as it may be called, effectually walls off any secretion from the peritoneal cavity and reduces to a minimum the danger from sloughing of the appendicular stump.

The following case, that of Private J. A., is of especial interest. In this case the operation for appendicitis was performed about three weeks after an operation for the radical cure of hernia, which had been successfully performed at this hospital. Subsequent to the hernia operation the patient had experienced frequent attacks of pain in the right iliac region. He gave a history of having had these pains for several months at irregular intervals. The operation for appendicitis was performed in the usual manner, and the appendix removed. It was much swollen and congested and bound down by adhesions. Microscopical examination showed the typical appearances found in recurrent appendicitis.

About three weeks after the appendectomy he began to experience severe pain in the hypochondriac region of the right side. He had a slight rise of temperature daily, and gave a history of having fallen upon his right side in 1899, striking his body in the region in which the pain complained of was present. An exploratory operation was decided upon. On opening the abdomen, in the right semilunar line, many adhesions were found between the omentum and the transverse colon; the neighboring glands were much enlarged, and a portion of indurated tissue and several enlarged glands were removed. The liver and gall bladder appeared normal. For a few days his condition was somewhat improved, but the pains returned with greater intensity, and a well-marked tumor appeared beneath the wound. It was decided to open the abdomen in the line of the previous incision, which was accordingly done, and careful exploration discovered a hard indurated mass forming in the mesentery of the transverse colon. This mass was about the size of a small orange, and invaded the wall of the gut. The tumor was removed and about three inches of the transverse colon excised, the ends of the gut being united by a Murphy button. After the operation the wound closed readily and the patient improved rapidly, leaving the hospital in an apparently normal condition. Microscopical examination of the growth showed it to be of sarcomatous origin. At this date, six months after operation, no evidence of a recurrence of the growth has been observed.

ACUTE APPENDICITIS.

J. O'H., officer's son.—Patient was admitted to the hospital October 5, 1900. On admission there was moderate pain and well localized tenderness in the right iliac region. These symptoms had been present for ten days prior to admission. At the onset there had been some vomiting, several slight chills, and the bowels had been constipated. Patient gave a history of having had a similar attack six months before the present one. On the day following admission the temperature rose and his general condition appeared more serious.

Operation October 5, 1900: An incision was made through the abdominal wall at the outer side of the right rectus muscle, and a small localized abscess was found in the region of the appendix, shut off from the general abdominal cavity by adhesions. The appendix was found within this cavity in a gangrenous condition and ruptured. The appendix was removed, its stump cauterized, and the abscess cavity thoroughly washed out with salt solution. A drainage of iodoform gauze, surrounded by gutta-percha tissue, was left in the wound and the abdominal wall partly closed. No

unfavorable symptoms followed the operation. The wound healed by granulation and the patient made a good recovery, leaving the hospital November 6, 1900.

M. C., private, Battery H, Fourth Artillery.—Patient was admitted to hospital February 10, 1901, complaining of pain and tenderness in the right side of the abdomen. These symptoms, together with constipation, nausea, and vomiting, had been present for several days. On examination well localized tenderness was found in the right iliac region, with some rigidity of the abdominal muscles. Upon admission the temperature was 100.2° F. and a few hours later became 102.6° F.

Operation February 11, 1901: The usual gridiron incision was made near McBurney's point. The appendix was found in its normal position, much swollen and congested, with numerous fresh adhesions, while the peritoneum of the intestine in the vicinity was much inflamed. The appendix was removed without difficulty, ligated with catgut, the stump cauterized with carbolic acid, and the peritoneum sutured over the stump. Patient made a good recovery from the operation, and was returned to duty in April, 1901.

J. T. W., recruit, unassigned.—He was admitted to the hospital on May 7, 1901, complaining of pain in the lower portion of the right side of the abdomen. Upon examination a small tender tumor was found in the right iliac region, a little above Poupart's ligament. There was no particular tenderness over McBurney's point. He had a temperature of 101° F.; a pulse about normal and of good quality; the bowels were regular and there was no nausea or vomiting. He had suffered from pain in this region for three days before admission. He was kept under observation for several days, but no particular change occurred in the symptoms, except that the evening temperature went up to 103° and 104° F., and an operation was decided upon.

Operation May 14, 1901: An incision was made through the abdominal wall over the tumor, a little above Poupart's ligament. A large abscess cavity was found extending well down into the iliac fossa. A large amount of pus was evacuated, together with some broken-down necrotic tissue. The appendix could not be found. The abscess cavity was localized and entirely shut off from the abdominal cavity. Patient made a good recovery from the operation.

RECURRENT APPENDICITIS.

J. D. C., private, Company H, Sixteenth United States Infantry.—Patient was admitted to this hospital on January 7, 1901, from the Philippine Islands. He gave a history of having had several attacks of appendicitis, the first in May, 1900. During each attack there had been abdominal pain and tenderness localized in the right iliac region, a moderate rise of temperature, and some nausea.

On admission there was slight tenderness in the region of the appendix, which he said had been present for several months. The bowels were regular. Five days after admission there was a slight attack of pain in the right iliac region with a rise of temperature to 99° F.

Operation January 14, 1901: An incision was made through the abdominal wall near McBurney's point, the muscle fibers being separated longitudinally, making the gridiron opening. The incision, as in all such cases in this hospital, was about 3 centimeters in length, while the opening through the fascia of the external oblique was made a little longer. This gives an increased working space, owing to the elasticity of the skin. The appendix was found in its normal condition and free from adhesions. It was, however, unusually long, much congested, and contained a fecal concretion about the size of a pea. It was removed in the following manner: First the mesentery was ligated with catgut and the appendix freed to its base; next a circular incision was made through the peritoneal covering about 1 centimeter from its base and this portion turned back toward the cæcum, forming a cuff. The appendix was then ligated with medium-sized catgut, close to the intestine, excised, and the stump cauterized with pure carbolic acid. The cuff of peritoneum was sutured over the stump with fine silk, forming a complete covering.

The abdominal cavity was then closed in the usual manner, catgut sutures being used for the peritoneum and each layer of fascia, and a subcuticular silkworm gut suture for the skin. Patient made a good recovery, the wound closing by primary union, the sutures being removed on the eighth day.

P. C. C., private hospital corps, United States Army.—Patient was admitted to the hospital on February 1, 1901, and gave a history of having had several attacks of appendicitis. These attacks were characterized by well-localized pain in the right iliac region, some fever, nausea, and constipation. The last attack was in the Philippine Islands in January, 1900, and since that time, while there have been no definite attacks, he has always had a little tenderness in the region of the appendix. Upon admission there was some tenderness in this region and slight rigidity of the abdominal muscles.

Operation February 4, 1901: The usual gridiron incision was made through the abdominal wall near McBurney's point and the appendix found in its normal position. It was surrounded by many old, dense adhesions and the tip of it was very firmly adherent to the margin of the pelvis. It was removed, however, without difficulty, the stump was cauterized with pure carbolic acid and covered over with peritoneum. The abdominal wall was closed in the usual manner, catgut for the buried sutures and a subcuticular silkworm-gut suture for the skin. The wound healed without complications, and the patient was returned to duty March 5, 1901.

F. S., private hospital corps, United States Army.—Patient was admitted to the hospital February 13, 1901, and gave a history of having had a fall while carrying a litter in the Philippines in April, 1899. Since that time he has had frequent attacks of pain in the region of the appendix, these attacks coming on at intervals of a few months. Recently the attacks have become more severe, and have been attended with nausea and vomiting, constipation of the bowels, and well-marked localized tenderness. On admission his temperature was normal, but there was localized tenderness and rigidity of the abdominal muscles in the right iliac region.

Operation February 19, 1901: An incision was made through the abdominal wall a little to the right of the rectus muscle, near McBurney's point. The peritoneum of the abdominal wall was found much congested and edematous, and upon carrying the incision through this a small abscess cavity was found close to the abdominal wall, and shut off from the general abdominal cavity by dense adhesions. The appendix was found in the midst of this cavity, ulcerated through, near its base. It was removed and the cavity irrigated; the abdominal wall was partially closed, a drainage being left consisting of strips of iodoform gauze surrounded with gutta-percha tissue. The patient made a good recovery without complications, the wound healing readily by granulation.

Mrs. K.—Patient was admitted to hospital on March 5, 1901, with a history of having had several attacks of appendicitis extending over a period of about two years. Since January, 1901, there have been constant pain and tenderness in the right side of the abdomen, some fever at times, marked disturbance of digestion, and constipation of the bowels. Upon examination, well-marked tenderness was found in the region of the appendix, also rigidity of abdominal muscles of the right side.

Operation March 6, 1901: An incision was made through the abdominal wall a little to the right of the rectus muscle. The fascia and muscle were separated longitudinally making the gridiron incision. The appendix was found much enlarged and congested and bound down by numerous old and recent adhesions. It was liberated and removed and found to contain large fecal concretions. The stump was cauterized with pure carbolic acid and invaginated into the wall of the colon. The wound was then closed in the usual manner and the patient made a good recovery without complications.

S. A. H., musician, Company G, Thirty-ninth United States Volunteer Infantry.—Patient was admitted to this hospital July 21, 1900, convalescent from malaria and typhoid fever, which he had contracted in the Philippine Islands. Since January, 1900, he has had several attacks of pain in the right iliac region with marked abdominal tenderness and constipation. There was no nausea or vomiting, but a slight rise of temperature.

Operation August 13, 1900: An incision was made through the abdominal wall to the outer side of the right rectus muscle, the muscular fibers being separated longitudinally making the gridiron incision. The appendix was found in its usual position surrounded by many adhesions and much swollen and congested at the extremity. It was removed without difficulty and the peritoneum sutured over the stump. The abdominal wall was closed in the usual manner and the patient made an uninterrupted recovery.

CHRONIC PERITONITIS WITH INTESTINAL ADHESIONS.

H. D. B., private, Company K, Fourth Infantry.—The patient was admitted to the hospital on September 23, 1900, from the Philippine Islands. He gave a history of having had, for several months, frequent attacks of pain in the right iliac region, accompanied by moderate abdominal tenderness; but there was no fever or vomiting with the attacks. After being kept under observation for some time, it was thought that the patient was suffering from chronic appendicitis and an operation was performed and the appendix removed on October 18, 1900. The appendix was found somewhat congested and bound down by numerous adhesions. It was removed in the usual manner, the adhesions broken up, and the patient made a good recovery. About three weeks after the operation the pain returned, at which times there was knotting of the intestines in the right iliac region from the accumulation of gas, and it was decided to reopen the wound and relieve the adhesions.

Operation December 1, 1900: An incision was made through the cicatrix of the former wound in the abdominal wall. Many recent adhesions were found about the lower end of the ileum and the cæcum matting the intestines rather firmly together, and scattered over the peritoneum of this region were numerous small deposits which looked like miliary tubercles. The adhesions were broken up, the intestines liberated, and the abdominal wall closed layer by layer, catgut being used for buried sutures and silkworm gut for the skin. The wound healed without complication and for a time the patient's condition was improved, but the attacks of pain soon returned, although his general condition became fairly good. He was discharged on surgeon's certificate of disability January 17, 1901.

ANEURISM, CIRROID.

R. C. B., private, Company I, Twenty-fifth United States Infantry.—Patient was admitted to hospital September 23, 1900, suffering from a cirroid aneurism of the temporal artery anterior to the left ear. He gave a history of a fall in the Philippine Islands in December, 1899, striking on the left side of his face, and about a month later noticed an enlargement and pulsation of the artery in front of the left ear.

Operation September 29, 1900: The dilatation of the vessel extended along the side of the face anterior to the left ear for about one inch and a half, and this portion of the vessel was removed after numerous ligations of the temporal artery and its branches. Considerable bleeding was encountered at the operation, but it was easily controlled. The wound healed rapidly, and there has been no recurrence of the condition.

EMPYEMA.

Eight cases of this character were operated upon by resection of a portion of one or more ribs, and all recovered save one. This case was so extremely debilitated on admission to the hospital from malarial fever and dysentery, contracted in the Philippines, that when he subsequently developed pneumonia of the left lung, followed by empyema, there was very little hope of his recovery, and although the operation was performed as rapidly as possible, his already weakened condition militated against the normal reaction, and he died in forty-eight hours from exhaustion.

The following cases illustrate the conditions present in these operations:

H. R., retired soldier.—Had been shot in the right chest in 1877, and since that time had had occasional pain in the right scapular region, posteriorly. The physical examination of the chest revealed marked flatness over the middle line posteriorly of the right side, and a few inches below the lower border of the scapula. An aspirating needle introduced between the sixth and seventh ribs revealed the presence of pus. He was operated upon, and 1½ inches of the sixth and seventh ribs were removed in the anterior axillary line. The pleura was found much thickened and adherent to the chest wall. Upon incising this an abscess cavity the size of a large orange was discovered, the wall of which was covered with a thick calcareous deposit. The cavity was washed out, a large portion of the calcareous lining removed, and a drainage tube left in the wound. The patient's condition improved very rapidly and the cavity contracted to a small sinus. A slight discharge still came from the sinus when the patient left the hospital, but he was otherwise well.

A. E. A., musician, Company A, Forty-sixth United States Volunteer Infantry.—The patient was admitted to the hospital on May 18, 1901, from the transport *Sheridan*, with a pneumonia of the lower lobe of the left lung, which had been present since May 14. On admission his temperature was 102° to 104° F., and during the next ten days it fluctuated between 98° and 104° F. His pulse was rapid, generally about 120. On May 30 the diagnosis of empyema was made, and an aspirating needle introduced into the fifth intercostal space in the anterior axillary line revealed the presence of pus.

Operation May 30, 1901: A portion of the fifth rib was removed in the anterior axillary line, the pleural cavity opened, and a large amount of pus evacuated. The cavity was irrigated with a weak solution of lysol and a drainage tube inserted. The wound healed without complications, the patient making an uninterrupted recovery.

J. B., private, Company D, Thirtieth United States Volunteer Infantry.—Patient was admitted to the hospital on April 12, 1901, with measles. A few days after admission he developed pneumonia of the lower lobe of the right lung. On May 9 there were signs of fluid in the right pleural cavity, and an aspirating needle introduced in the seventh interspace showed the presence of pus.

Operation May 11, 1901: About 1½ inches of the seventh rib was removed in the posterior axillary line; the pleural cavity was opened and a large amount of pus evacuated. The cavity was irrigated with a weak lysol solution, and a drainage tube

inserted. At the time of the operation the patient was in a very poor condition, but he soon began to improve; the lung expanded, the abscess cavity became reduced in size, and he was discharged from the hospital cured.

GUNSHOT WOUNDS.

Sixteen operations were performed during the year upon cases suffering from gunshot wounds. The character of the operations will be seen from the following illustrative cases:

H. O. R., quartermaster's employee.—The patient was admitted to this hospital August 4, 1900, suffering from pain and weakness in the region of the left hip joint, the result of gunshot wound received in the Philippines March 1, 1900, when he was in the employ of the Quartermaster's Department, United States Army. The bullet struck the left side of his cartridge belt, exploding two shells, and all three bullets entered the outer side of the left hip. Examination by the X-ray revealed the presence of a foreign body just above the capsule of the hip joint.

Operation August 9, 1900: An incision was made in the left gluteal region and the fibers of the muscles were separated longitudinally. The bullets were found in the position indicated by the radiograph just above the capsule of the hip joint, and were easily removed from that position. The wound was then irrigated and closed in the usual manner. It healed by primary union and the patient made a perfect recovery, being discharged from the hospital on September 25, 1900, with the functions of the joint practically restored to their normal condition.

F. H., private, Company K, Fourth Infantry.—The patient was admitted to this hospital April 3, 1900, suffering from gastro-enteritis. He also had a bullet in the left side, the result of a gunshot wound received in the Philippine Islands. The bullet entered the outer aspect of the left thigh near the middle with no wound of exit. A careful examination with the X-ray showed the bullet to be located near the middle of the thigh close to the outer side of the femur.

Operation August 22, 1900: An incision was made through the scar left by the wound of entrance, but this failed to locate the bullet and another incision was made on the posterior aspect of the thigh, and through this the bullet was easily removed. The wounds healed readily, and the patient was discharged on October 19, 1900.

G. E. G., captain, Thirty-fourth United States Volunteer Infantry.—The patient was admitted to the hospital September 24, 1900, suffering from the effects of a gunshot wound of the left side of the lower jaw and of the right shoulder, which had been received in action in the Philippines on July 22, 1900. On admission to this hospital there was a sinus leading down to the lower jaw near the angle, from which there was a moderate discharge. There was also a sinus through the spine of the right scapula, the upper opening being a little behind the clavicle and the lower one a little below the middle of the scapula. The patient's general condition improved, but the sinuses remained with a moderate amount of discharge, evidently due to the presence of necrosed bone.

Operation October 28, 1900: The sinuses were enlarged and several pieces of necrosed bone removed, both from the angle of the jaw and from the shoulder. The wounds were then thoroughly curetted and packed with iodoform gauze. After this operation, the wound in the shoulder healed rapidly and was entirely closed at the end of four weeks. The wound at the angle of the jaw partially healed, but a small sinus remained, apparently caused by discharge from the parotid gland, the duct of which had been cut at the time of the injury.

F. R. L., second lieutenant, Ninth United States Infantry.—The patient was admitted to the hospital October 19, 1900, suffering from the effects of a gunshot wound received in action in China July 13, 1900. There was paralysis of the right arm, and considerable pain in this arm and right shoulder. Examination with the X-ray revealed the presence of a bullet in the right side of the neck which had entered near the middle of the right scapula.

Operation October 24, 1900: After the patient was anesthetized the bullet could easily be felt at the base of the right side of the neck, near the transverse process of the sixth cervical vertebra. It was removed from this position without much difficulty through a small incision. The wound healed readily by primary union, no complications resulting. After operation the condition of the arm improved somewhat, but its function was not fully restored.

J. S., private, Company M, Fourteenth Infantry.—The patient was admitted to the hospital October 19, 1900, with paralysis of the left forearm and hand, the result of a gunshot wound received in action in China on August 6, 1900, through the upper part of the left arm. There was complete paralysis of the muscles supplied by the musculospiral nerve.

Operation November 13, 1900: An incision was made on the outer aspect of the arm over the musculospiral groove down to the nerve, in order to see if this had been severed at the time of the wound. The nerve was found intact, but compressed by the callus which was thrown out from the fractured end of the bone. It was liberated from this position and raised up into the soft tissues and the wound was then closed. The wound healed readily after the operation, but the condition of the forearm and hand remained practically the same. The patient was discharged on surgeon's certificate of disability.

A. C., private, Company D, Thirty-ninth United States Volunteer Infantry.—Patient was admitted to the hospital on February 3, 1901, suffering from partial paralysis of the right hand and constant pain in the palm of the hand, the thumb and fingers supplied by the median nerve, the result of a gunshot wound received in the Philippines in September, 1900, the bullet passing through the lower third of the right arm, shattering the humerus. The most important symptom for which the operation was performed was the excessive pain from which the patient suffered almost continually.

Operation February 10, 1901: An incision was made just above the elbow, over the line of the median nerve. The nerve was found surrounded by dense cicatricial tissue. In the lower portion of the wound two pieces of the jacket of the bullet were found pressing upon the nerve and partially embedded in the substance. These were removed and the nerve freed from adhesions. Almost immediately after the operation the pain disappeared. The wound healed rapidly and the condition of the patient was very much improved. He was discharged from the hospital February 20, 1901.

VENTRAL HERNIA.

Five cases of ventral hernia were operated upon during the year, all of which were the result of operation or injuries in the Philippine Islands. The results obtained after operation in this hospital were very satisfactory. The two following cases will show the character of these operations:

F. M., private, Company M, Twenty-ninth United States Volunteer Infantry.—Patient was admitted to the hospital February 3, 1901. He had a moderate-sized ventral hernia, which was the result of an operation for appendicitis performed in the Philippines in February, 1900.

Operation February 13, 1901: The old cicatricial tissue of the skin and fascia was removed and the incision extended through the abdominal wall. The peritoneum was found much retracted, with the omentum adherent to its edges. These adhesions were broken up and the wound closed after the manner of a fresh incision by suturing the peritoneum and the different layers of fascia separately. The skin was closed with a sub-cuticular silkworm gut suture. Patient made a good recovery, and left the hospital March 19, 1901.

T. S., discharged soldier.—Patient was admitted to the hospital on January 7, 1901, and was found to have a small ventral hernia in the right iliac region, which followed an operation for appendicitis performed in the Philippine Islands.

Operation January 9, 1901: The cicatrix of the old wound was excised and an incision made through the abdominal wall over the hernia. In the lower portion of the wound the abdominal wall was very much thinned out by separation of the muscles and fascia so that the hernia projected close to the skin. The different layers of the abdominal wall were isolated as far as possible, and the wound closed after the manner of a fresh incision, each layer, including the peritoneum, being sutured separately. Catgut was used for the buried sutures and silkworm gut for the skin. The wound closed by primary union and a good result was obtained.

INGUINAL HERNIA.

Thirty-five cases of inguinal hernia were operated upon, of which 34 recovered with good results and 1 died. This patient was a discharged soldier who had suffered much from illness in the Philippines, and whose general condition was very poor owing to prolonged dissipation since his return from the Orient. These facts were not known at the time of the operation. He took the anæsthetic very badly and died of congestion and œdema of the lungs.

The usual Bassini operation was performed in these cases, and the material found most suitable for sutures was catgut for the buried sutures and silkworm gut for the skin sutures, by the subcuticular method.

The following cases illustrate the character of these operations:

J. A. J., sergeant, Company I, Thirty-fifth Infantry, United States Volunteers.—Patient was admitted to the hospital July 28, 1900, with a moderate-sized indirect inguinal hernia of the right side, the result of a fall in January, 1900, in the Philippines.

Operation August 8, 1900: The usual Bassini operation was performed in this case. The operation was rendered more difficult on account of firm adhesions between the sac and the scrotal tissues. The omentum was also closely adherent to the wall of the sac. The sac protruded on both sides of the epigastric vessels, forming both a direct and indirect hernia. The sac, however, was reduced without much difficulty and ligated external to the epigastric vessels, and the wound closed in the usual manner. Patient made an uninterrupted recovery.

R. T. S., M. D.—The patient was admitted to the hospital July 26, 1900, with a moderate-sized, indirect inguinal hernia on the left side, which had been present for about eighteen months.

Operation July 28, 1900: The Bassini operation was performed, but was rendered more difficult than usual on account of a very thick abdominal wall. The internal ring was also very large. In this case the internal ring was closed with sutures of chromicized catgut. Ordinary catgut was used for the superficial buried sutures and the wound closed in the usual manner. At the end of six days after the operation there was a slight rise in temperature and a small accumulation of purulent fluid in the lower portion of the wound. This was drained out and the wound irrigated and packed with iodoform gauze. No other complications followed and the patient made good recovery.

E. S., chief trumpeter, Third Artillery band.—The patient was admitted to the hospital on May 22, 1901, with an indirect inguinal hernia of the left side. The hernia was small and was a recurrence after an operation on this side, two and a half years ago.

Operation May 25, 1901: The regular Bassini operation was performed, but was rendered a little more difficult than usual on account of some old scar tissue from the previous operation. The operation was concluded in the usual manner, the wound healed by primary union with excellent results.

J. L., private, Company A, Twenty-first Infantry.—Patient was admitted to this hospital October 19, 1900, from the Philippines. He had a moderate-sized direct inguinal hernia in the left groin, the result of a fall in May, 1900. He was suffering from the effects of chronic dysentery and malaria, on his admission here, and was kept under treatment for these conditions for some time before it was thought best to operate.

Operation December 12, 1900: The usual Bassini operation was performed and the hernia sac was found to be small and protruded internal to the deep epigastric vessels, making a direct inguinal hernia. No complication arose during the operation and it was completed in the usual manner with catgut for the buried sutures and a sub-cuticular silkworm gut suture for the skin. The wound healed by primary union and the patient was sent to duty in good condition on January 20, 1901.

INTERNAL AND EXTERNAL HEMORRHOIDS.

Twenty operations for hemorrhoids were performed during the year, of which 8 were for external hemorrhoids, 4 for internal hemorrhoids, and 8 for combined external and internal hemorrhoids. The method of operation was by ligation, the tumors being held by a clamp, the skin and mucous membrane incised about their base, then ligated with silk and removed. The following case is illustrative of all these operations:

M. P. W., private, Company C, Thirty-third Infantry, United States Volunteers.—Patient was admitted to this hospital January 7, 1901, suffering from rather large hemorrhoids, which were found to be both internal and external to the sphincter. He had suffered from chronic diarrhea in the Philippine Islands and had noticed the hemorrhoids for several months.

Operation January 17, 1901: The tumors were held by a clamp and the skin and mucous membrane incised at their base when they were ligated with silk and removed. At the conclusion of the operation a small glass tube wound with strips of iodoform gauze was inserted in the rectum just through the sphincter so as to enable the patient to pass gas without difficulty. The bowels were moved after five days and a good result was obtained from the operation. He was discharged from the hospital on February 5, 1901.

NERVE STRETCHING.

Two operations of this character were performed, in one case the median nerve and in the other the sciatic nerve being stretched. The conditions present were such that a partial paralysis existed in the extremity, this condition resulting in both cases from gunshot wounds affecting the nerve. Slight improvement was shown in both cases, but full restoration of function did not occur.

VARICOCELE.

Thirty-one cases of this condition were operated upon by the suprapubic method, reported upon in Circular No. 3, S. G. O., February 27, 1901. This operation gives the most successful results, especially in the avoidance of sepsis and in maintaining the circulation by retention of a sound vein of the plexus. For further safety, after the veins are ligated, the ends of the ligatures are anchored to the external ring. The deep and superficial fasciæ are then carefully separated and united by continuous catgut suture and the skin by a subcuticular suture of silkworm gut.

The following case is inserted as an illustration of the general character of these operations:

F. F., private, Company H, Fourteenth Infantry.—The patient was admitted to this hospital October 19, 1900, convalescent from chronic diarrhea and heat prostration which occurred in China in 1900. He presented a moderate-sized varicocele of the left side which he first noticed in December, 1899.

Operation November 12, 1900: The usual operation for varicocele was performed, a small suprapubic incision being made and a portion of the enlarged vein excised. The ends of the vessels were joined together with catgut and the ligatures anchored to the external ring. The wound was closed with catgut for the deep sutures and silkworm gut, by the sub-cuticular method, for the skin. The patient made a good recovery from the operation, although convalescence was somewhat retarded by frequent attacks of severe headache, evidently a sequel of the heat-stroke above mentioned.

GUNSHOT WOUND OF BRAIN, REPORTED BY J. CARLING, LIEUTENANT AND ASSISTANT SURGEON, THIRTY-FIFTH INFANTRY, UNITED STATES VOLUNTEERS, NOVEMBER 14, 1900.

I have the honor to report the following interesting case of penetrating gunshot wound of head: The patient, a Filipino boy, age 16, was wounded by a .30-caliber Krag-Jørgensen bullet during an attack by insurgents on the town of San Miguel de Mayumo, Luzon, P. I., on the night of October 13, 1900. The patient was admitted to hospital one hour after receipt of injury with complete hemiplegia, left side. Temperature was 100, pulse slow and full, respiration normal. There was some nausea and vomiting and retention of urine. Pupils were dilated; special senses were not affected, but there was some loss of sensation on paralyzed side. Consciousness was retained, patient being very restless and talkative. Inspection showed the entrance of bullet on right side of head directly over the posterior border of the fissure of Rolando, 1½ inches to right of median line. The wound was circular in shape, half an inch in diameter, and filled with clotted blood, hair, and débris. There was no wound of exit. The wound was irrigated with a solution of bichloride of mercury 1 to 2,000, foreign particles removed, and antiseptic dressing applied. On the following morning the patient's temperature was 101° F., and, as his general condition was otherwise unchanged, the operation of trephining was performed, assisted by Contract Surg. E. N. Bowen. After thoroughly shaving and cleansing the head, the patient was placed under chloroform anæsthetic and crucial incision made in scalp, extending an inch on either side of wound. When the flaps were retracted, a circular hole was revealed in the skull, one-third of an inch in diameter, with roughened and depressed margins, and beneath the torn dura were clots of blood, loose hairs, small fragments of bone, and broken-down brain tissue. The inner table also was found to be splintered. In order to obtain better access to the injured brain, with a view to removing the foreign bodies embedded therein, the trephine was used, and two buttons of bone, each one-quarter of an inch in diameter, were cut out on either side, while the elevator and rongeur forceps were used to elevate and trim the rough margins. Fifteen pieces of bone in all were removed, some being embedded in the brain half an inch beneath the dura. An attempt was then made to locate the bullet. By means of a blunt probe of soft metal its course was followed a distance of 4 inches in a direction downward and backward at an angle of 45°, after which it was lost. Deeming further probing dangerous to the life of the patient, the wound was thoroughly irrigated with a warm solution of boracic acid, packed with iodoform gauze, and the scalp sutured with interrupted sutures of silk, leaving a small opening below for drainage. On the day following operation the patient's condition greatly improved. He complained of very little pain and was less talkative and restless. The nausea and vomiting had ceased and he had full control over urine, but there was no change on the paralyzed side. His temperature was 99.5° F.; pulse, 80; respiration, 20. On October 17, forty-eight hours after operation, his temperature reached normal, and remained so until the end of his convalescence. On Octo-

ber 23 patient was able to move toes and ankle on paralyzed side. On October 28 he was able to raise the entire left lower extremity from bed and was slowly regaining power in upper extremity. As the paralysis cleared up normal sensation returned, and at time of making this report the patient has almost entirely recovered from the paralysis with a clean wound and a sound body. The wound in head, having been frequently dressed, healed by granulation from side to bottom, leaving only a slight scar to mark the entrance of bullet. The latter is now undoubtedly becoming encapsulated at the base of brain, and it will be interesting to know if ill results follow.

With this end in view, the patient will be kept under observation as long as possible and report made later if anything develops. * * *

SUPPLEMENTARY REPORT DATED MARCH 1, 1901.

I have the honor to present the following supplementary report of a case of gunshot wound of head, the original report covering operation having been made under date of November 14, 1900, a copy of which is herewith attached. As the patient is about to pass from under my observation it may prove interesting to note his present condition. Nearly five months have now elapsed since receipt of injury, during which time the patient has steadily improved. His mind is perfectly clear, sight, hearing, taste, and smell normal, and common sensation on hemiplegic side is not affected. The hemiplegia (left) has almost entirely disappeared, the only disability remaining being slight ankle-drop which is scarcely perceptible. Patient now attends school regularly, and is considered by his teacher the most promising pupil in his class. He has an excellent voice, and the injury to head and resulting operation has in no way affected it, so that he is again able to resume his place in church choir. The progress therefore in this case is excellent, and the occurrence of sequelae in later years is, in my opinion, very unlikely.

SPECIAL REPORT OF CASES OF FROSTBITE ADMITTED TO HOSPITAL AT FORT ST. MICHAEL, ALASKA, MARCH 2, 1901, BY R. G. EBERT, MAJOR AND SURGEON, UNITED STATES ARMY.

James McNeill, miner, American, 49; John Callaghan, laborer, Irishman, 30, and Frank Madden, sailor, American, 34, were frozen by being imprisoned in a tent by snowdrifts, without fire or means of making same, on the trail to the Kuskokwim country while on a "stampede," 230 miles from St. Michael and 10 miles from the nearest native village, during a storm which raged over northwestern Alaska, January 20 to 28, 1901. Their cases were reported to military authorities at St. Michael on February 24, and a relief party sent out the following day, which brought them in, after a seven days' trip by dog teams, on March 2.

When they arrived at this hospital McNeill and Callaghan had both hands and Madden both feet frozen. Gangrenous odor very marked; extreme exhaustion from starvation (having lived on short rations of native food, dried salmon, etc., for twenty-nine days), exposure to climatic conditions, results of injuries, and lack of attention. While lying at this village they were unable to help themselves, and the natives showed great aversion to them and were reluctant to render the most trifling assistance.

Upon arrival here their wounds were cleansed and dressed, but owing to their exhausted condition no operative measures were taken until March 4, when McNeill, the strongest, was put on the table. All proximal phalanges and distal ends of first, third, and fifth metacarpal bones of right hand were denuded, soft structures beyond mummified with granulations and gangrenous tissues above points of denudation. The condition of the left hand was similar to that of the right, the points of denudation being the distal ends of first and fourth metacarpal bones, distal ends of second and third proximal phalanges, and fifth proximal phalanx. Right wrist also frozen, styloid process diseased, gangrenous slough about 2 inches in diameter directly over it; to a less degree this was also the condition of the left wrist. The index and ring fingers were disarticulated at the knuckle; distal ends of first, third, and fifth metacarpal bones had to be removed before sufficient tissue could be obtained to cover them. The styloid process was chiseled away and gangrenous tissue thoroughly curetted. Subsequently, on several different occasions skin-grafting was performed on the granulating surface with gratifying results. Constant cardiac stimulation was necessary throughout the operation. This condition precluded further operative procedures. March 9 the diseased tissues of left hand were removed in the following manner: Thumb amputated at distal end of metacarpal bone, index and middle fingers at distal third of proximal phalanges, and ring and little finger at metacarpo-phalangeal joints.

Tissues forming the flap over the distal end of fourth metacarpal failed to unite and required a secondary operation on April 6. Everything which showed the least signs of vitality was left at the time of operations. This necessitated a third appearance on the table, but, with the exception of the two phalangeal stumps on left hand, nothing of value could be saved. Wounds were entirely healed on May 10.

Callaghan's condition was as follows: Nervous prostration (constant tremors awake and sleeping) prevented operating prior to March 6. Line of amputation was approximately as follows: Distal third proximal phalanx of thumb, index finger at metacarpo-phalangeal joint, head of metacarpal bone of middle finger, distal third of fourth and middle of fifth metacarpal bones. A line, including a somewhat greater amount of structure, will define the points of operation on the left hand. Amputations on both hands were simultaneous, Dr. L. T. Mitchell operating on the left. Erysipelas developed in the left stump March 9. The patient was promptly isolated and all precautions used to prevent contagion. Two days after their inception the symptoms subsided. The flaps failing to unite, granulating surfaces were stimulated by grafts and cicatrization occurred in a surprisingly short period. Both stumps have been completely healed for six weeks and the man is able, with the remainder of his thumbs, using them against the second metacarpals, to perform all minor offices for himself.

Madden was in a wasted and anæmic condition. Excepting the feet, nothing but the left wrist was frozen. The right foot was a mass of diseased and denuded bone and gangrenous tissue. The destructive process was not so extensive in the left foot, the tarsal bones, with the exception of the posterior fourth of the calcaneum, not being involved and the line of demarcation being drawn through the proximal third of the metatarsal bones. On March 8 an attempt was made to operate, but before complete anæsthesia could be obtained his condition became so feeble that the operation was postponed. Under continued tonic treatment and stimulation amputation of right foot 3 inches above the ankle joint by antero-posterior flap was performed with complete union in two weeks. Owing to manifestations of malaria ("Chagres fever," contracted in 1896) operation on left foot had to be postponed until April 10, when amputation through the upper third of the metatarsals and removal of the posterior fourth of the os calcis was performed. Diseased soft structures of heel were so extensive that in after treatment recourse was had to frequent skin grafts. Union here was slow but complete on May 20.

As it was desired to save as much as possible of the hands and feet, operations were performed through tissues which had been frostbitten, and in no instance, except in Madden's right limb, was there immediate union, and with only this exception the operations were necessarily not aseptic.

Ether was the anæsthetic used, being administered by Hosp. Steward John L. Henderson. Acting Hosp. Steward Alexander T. MacPherson was the able assistant in all operations. To both much credit must be given for the success obtained. The nursing of these men by the members of the hospital corps at this post under the charge of Acting Steward MacPherson has proved a severe and arduous addition to their duties. It was cheerfully performed and is worthy of high praise.

REPORT OF OBSERVATIONS ON THE ORGANIZATION AND SERVICE OF THE MEDICAL DEPARTMENT OF THE GERMAN ARMY MADE DURING JULY, 1901, BY CAPT. JOHN S. KULP, ASSISTANT SURGEON, UNITED STATES ARMY.

The medical and sanitary service of the German army is a separate staff division and has advisory superintendence of matters pertaining to the health of the troops, command of medical officers above the rank of major, and partial control of those in the junior grades. Its personnel is divided into (1) General-Stabsärzte der Armee, with relative rank of brigadier; (2) General-Arzte, chief surgeons of corps, relatively colonels; (3) General-Oberärzte, chief surgeons of divisions, lieutenant colonels; (4) Oberstabsärzte, regimental surgeons, majors; (5) Stabsärzte, battalion surgeons, captains; (6) Oberärzte (first lieutenants), (7) Assistenzärzte (second lieutenants), assistant surgeons; (8) Sanitäts-Feldwebel, usually a graduate in medicine, sergeant-major; (9) Sanitäts-Sergeant, sergeant; (10) Sanitäts-Unteroffizier, corporal; (11) Sanitäts-Gefreiter, lance corporal or first-class private; (12) Sanitäts-Soldat, private.

The officers of the permanent service are thoroughly trained in the specialty of military medicine, the principal school being the Kaiser-Wilhelms-Akademie für das Militärärztliche Bildungswesen at Berlin. After the usual five years' course they are commissioned, with the understanding that they are then only ready to begin their service as medical officers, the continuation of which will require constant study and intelligent observation throughout their whole career. The perfect internal discipline of the corps is manifest at every turn, and the earnestness and enthu-

siasm of the personnel is worthy of mention. The possibility of having graduates in medicine as noncommissioned officers is explicable by the condition of universal military service, and from their experience it would seem that a similar requirement for our hospital stewards would be in the interest of increased efficiency.

There is no such organization as our hospital corps, but men (after one year's service in the line) are transferred to various schools, where they receive six months' instruction. This course is thorough and systematic, especially for the *gefreiter*, a grade which corresponds to our lance corporal or first-class private. Briefly, this instruction consists of lectures, demonstrations, and recitations on the duties of the hospital assistant within and without the hospital, including the care of the sick in quarters. Some of the other subjects of special instruction are the duty of the sanitary soldier when orderly, when detailed for the swimming or other exercises of the troops, and when chief of a hospital department. Accounting, clerical work, and the duties of a monitor receive detailed attention, and the course in elementary anatomy and physiology is simple, practical, and thorough.

After this preliminary instruction the student goes on to that on injuries, first aid, contagious and infectious diseases, disinfection, emergencies, dressings, and a study of the ailments peculiar to soldiers. The transportation of the sick is taught by practical work in hospital and field, and this is followed by an admirable course on the "care of the sick soldier in a military hospital." The systematic arrangement includes the sick man, the sick bed, the sick watch, the position and comfort of the patient, the observation of symptoms, the administration of nourishment and medicine, and the carrying out of orders. After this the men receive practical and theoretical instructions designed to qualify them as operating room assistants, dispensary assistants, and on the making of necropsies. A feature of all the teaching is that it not only states what is expected of the sanitary soldier, but also what he is not to attempt.

Ambulance companies are commanded by line officers, under the direction of chief surgeons, as the medical department does not possess a separate administrative service. The usual allowance of personnel and transportation are—

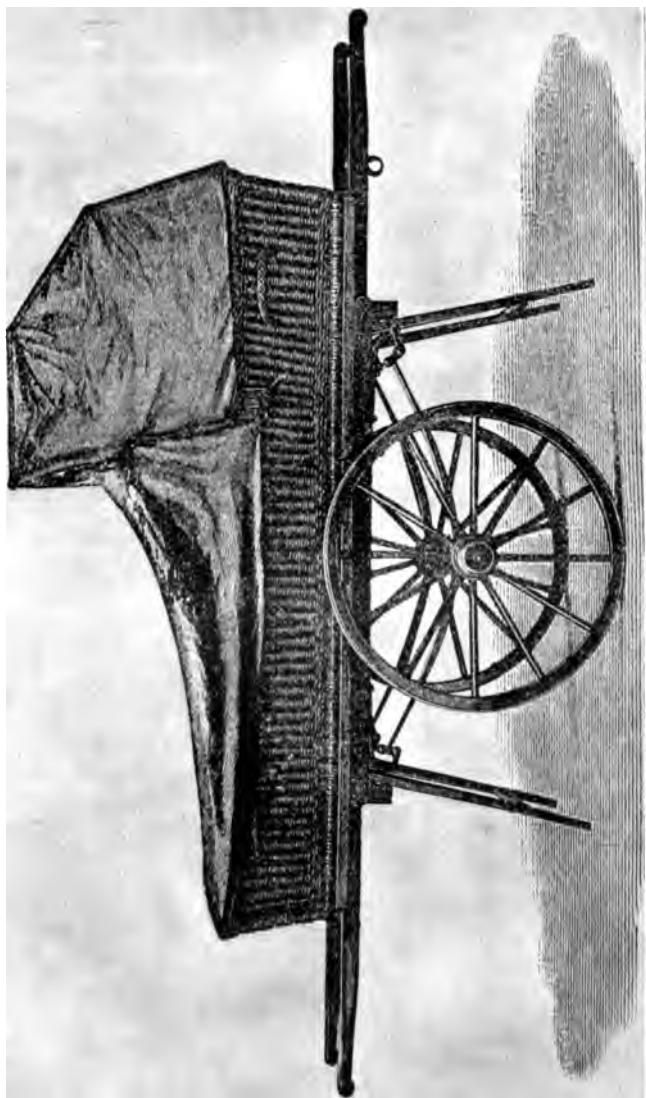
Medical officers	8
Line officers	3
Apothecary	1
Paymaster	1
Noncommissioned officers	14
Litter bearers (privates)	160
Other privates	67
Saddle horses	18
Draft horses	28
Wagon of "life-saving food"	1
Ambulance wagons	8
Wagons for dressings	2
Baggage wagons	2

To each army corps there are allowed 3 ambulance companies attached to divisions, and 2 held in reserve. The allowance of medical personnel to an infantry regiment of 3 battalions is usually 1 major, 2 captains, 3 lieutenants, 3 noncommissioned officers, and 12 privates in addition to the company bearers.

Medical department supplies.—In Germany, as in other countries which have learned the price of being unprepared for war, the medical department is in a position to take the field without delay. It is surprising to see in a country where comparative poverty among all classes is the rule rather than the exception, that the question of expense is hardly considered in the equipment of the army. The storehouses are of large size, well arranged, and clean. The officers in charge are alert and ambitious, and one of them was not only acquainted with the equipment of our own service, but had the proceedings of the Association of Military Surgeons, including the year 1899. The *Train-Dépot des Garde-Corps*, near Berlin, contains complete equipment for thousands of men in large brick storehouses with ample space. Painted chests are ready for packing, plainly marked on the outside with the names of the articles they are to contain, and on the inside so as to show the position of each piece. These chests are of suitable sizes to fit accurately into standard wagons and cars, and their contents are for the most part in small separate packages.

It is manifestly impossible to enumerate all the special features of interest, and indulgence is begged for the somewhat unsystematic method which is pursued in order to economize space.

The litters are of various patterns, but none seem so good as our own. The cover is laced on, and two heavy wheels with springs are provided so that one bearer can move it. All litters have large pockets and pillows, and one pattern of wheeled



A WHEELED LITTER, GERMAN ARMY.

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litter with a wicker body (illustration) is not unnecessarily heavy. The sling is part of the litter, as it should be, and chain slings with spiral springs are provided for use on trains. There is an issue of bedsacks, designed for straw, which have loops along the sides through which poles can be slipped, thus making an extemporized litter.

There has been much care taken in the proper equipment of improvised hospital trains, knocked-down lockers being kept ready for use, and a single broad, flat spring, which reaches across a freight car and holds the ends of four litters, is simple and practical. The regular hospital car is of the small size usual in Germany, and has twelve beds with hair mattresses, bed-side tables, two reclining chairs, one wheeled chair, hammocks for clothing, such as are used on Pullman cars, similar lavatories to those in the cabins of steamers, and various lockers for supplies. The beds can be lifted off and used as litters, and are arranged on a simple system of springs allowing universal motion. The canvas bottom is laced to a light hollow frame (as in our Lein-Irvine standee), and can be used without the mattress if desired. One car in each train is fitted up as a kitchen, and carries two steam ranges (taking steam from the locomotive), one coal range, ice chests, cooking utensils, dishes, and cutlery sufficient for 300 sick. An ordinary freight car acts as its tender.

The wagon transportation of the medical department consists of ambulances of four patterns, pharmacy wagons, bake wagons, and baggage wagons of several kinds. None are so well made as our own. The best ambulance is a large double-decked one, weighing 1,470 pounds, and requiring two or four animals. It carries an ambulance guidon above the center of the top during the day and a red lantern at night in addition to its side lights. This elevated position of the lantern commends itself. There is a rack for arms behind the high driver's seat. A form of ambulance used only in cities has rubber tires, and litters resting on large inflated rubber balls.

The pharmacy wagon is four wheeled, with a projecting hood over the rear, and a wide tail-board, which when down forms a dispensing table. The wheels cut under, the contents are well arranged and easily accessible, while forage is carried in a separate compartment below the body of the wagon, the weight of which is 1,700 pounds. As in the French service, all brakes are operated by either a wheel or crank.

The bake wagons are in pairs, one vehicle containing the oven, and the other the kitchen. They are each drawn by two animals, and can supply an hundred loaves an hour while en route.

The baggage wagons are heavy and are not adapted to American roads.

The instrument cases are well made and well arranged. Manganium, an alloy of manganese and aluminum, on account of its freedom from corrosion by disinfectants, has largely taken the place of aluminum, in spite of its greater cost. In this connection it may be said that after ten years' trial aluminum has not proved as valuable as was expected, and although still used for instrument handles, mess utensils, and to some extent as a constructive material, an order was in preparation prohibiting its use where a break would render useless a vehicle or implement. Seven new patterns of instrument cases have been recently adopted, and they appear complete and of good quality. The largest of these cases is 51 by 29½ by 15 centimeters, and some of its features are the use of glove fasteners to hold racks in place, the racks themselves being removable from the trays in order to facilitate sterilization and allow for the latter being used for solutions, the numbering not only of instruments, but also the place in the case where they belong, the flat thin shape of the pocket case (15 by 25 by 1 centimeters), and many minor details, such as thumb places on the small saws, rubber tipped percussion hammers, and Bergman's latest chisels. Every large hospital contains instruments and dressings for two field hospitals of 200 beds each; and these are always kept in immediate readiness for transportation.

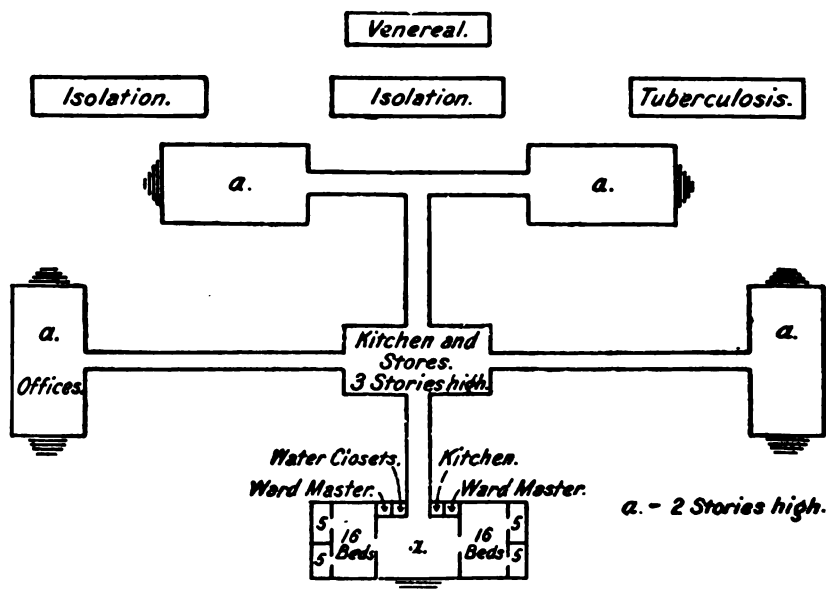
Hospital administration.—The largest hospital visited was the Garnisonslazareth in Tempelhof, which contains 750 beds. This is a permanent general hospital, built some twenty years ago, and is a separate military unit, commanded by a major of the medical department, who reports to the surgeon-general. On account of the age of the buildings it would be unfair to criticise their construction and arrangement from a modern standpoint, the general plan being as follows:

The entire grounds are inclosed by a high brick wall and are beautifully laid out, a feature of all German hospitals being the *lustplätze* for the recreation of convalescents. In regard to the institution as a whole, the police was very good, the clothing and appearance of the personnel fair, and the discipline perfect. The personnel seemed to me to be overworked and the institution correspondingly undermanned. For instance, in this hospital of 750 beds, 359 were occupied on the day of my visit, and the working force consisted of but 72 persons. These received aid from several gardeners and the convalescents were used rather unsparingly, I thought. Structural defects in the heating and cooking arrangements added much labor, and there

was an apparent lack of labor-saving appliances. The office work is not conducted on modern lines, the card system being unknown, and even typewriters but seldom used. A clean-cut system of recording and indexing appears much needed by European services.

Among the special features of this hospital are a well-equipped gymnasium containing machines for almost every form of passive motion, and an unusually complete X-ray department adjoining the operating rooms, which had the only females I saw in the institution—several wrinkled old hags, with kind faces. Almost every ward has its own kitchen, in addition to that for the general mess. This latter was clean and well managed, and had as its personnel a commissioned inspector, 1 non-commissioned officer, 2 cooks, 2 helpers, 2 dishwashers, and a butcher; 1.07 marks (about 26 cents) is allowed per ration and the diet is very liberal, the dinner for the day being clear soup, roast pork, noodles, green beans, roast potatoes, bread, and butter. It was well cooked and well served. Wine is furnished on most of the regular diet forms.

Field service.—The medical department of the German army exists for war and is ready for war. The field methods are, however, so radically different from our own that it is difficult to make just comparison. Canvas is little used, and when tentage is provided the troops sleep on it as often as under it. At the time of my visit there was a movement toward having all medical-department tentage of a special color, a



grass green, and this appears an excellent idea for various reasons. Tent pegs are metal bound and tipped.

Field hospitals have already been mentioned, valuable features of which are mobility and divisibility. The usual size contains 200 beds, and this is separable into two of 100 beds each, and they can pack up and move as quickly as a regiment. Portable huts are much used for semi-permanent hospitals, and sufficient of these for two hundred beds can be erected or torn down in between four and five hours. A feature of the field work is the arrangement for carrying it on at night, signal rockets, torches, and lanterns being provided in large numbers. The amount of transportation furnished the medical department seems sufficient, and the draft animals are superior to our own. In time of war all private horses are seizable by the Government.

The annual maneuvers give medical officers valuable lessons in field administration, and the necessity of a knowledge of terrain by chief surgeons seems to be well understood. Map making and especially map reading are of as great service to our own as to other staff departments.

Conclusion.—Germany is not so much a country with a large army as a nation in arms. Where every man is a trained soldier the medical officer enters the army with a technical knowledge secondary in value only to his professional education. It is



PORTABLE HUTS USED IN THE GERMAN SERVICE. CAPACITY 18 BEDS.





INTERIOR OF A HUT USED AS A READING ROOM.

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only by a union of the highest professional fitness with the ability to administer and command that a competent medical service is possible. In his earnest endeavor for improvement the German officer is second to none, the material equipment of his army is excellent, but in administrative methods we have little to learn from "The country in which all knowledge begins and ends."

In closing this report I desire to acknowledge my indebtedness to Lieut. Col. John B. Kerr, United States military attaché at Berlin, without whose intimate acquaintance with official methods and courteous assistance it would have been impossible to have gained the above information in the brief time at my disposal.

REPORT OF OBSERVATIONS ON THE ORGANIZATION AND SERVICE OF THE MEDICAL DEPARTMENT OF THE FRENCH ARMY, MADE DURING THE MONTH OF JUNE, 1901, BY CAPT. JOHN S. KULP, ASSISTANT SURGEON, UNITED STATES ARMY.

Organization.—The medical department (*service de santé*) is one of the five administrative departments of the French army, and is under the direction of its own officers, who are charged with carrying out of medical and hygienic measures, the command of the civil and military personnel permanently or temporarily attached to their service, and the administration and interior discipline of their corps. Unlike most foreign services, they are also charged with securing the material necessary to maintain and equip hospitals and sanitary organizations.

Personnel—Officers.—The officers of the corps are military surgeons, military pharmacists, and administrative officers.

Of the first class, there are:

Medical inspector-general, rank of major-general	1
Medical inspectors, rank of brigadier-general	11
Senior chief surgeons, rank of colonel	45
Junior chief surgeons, rank of lieutenant-colonel	60
Senior surgeons, rank of major	340
Junior surgeons, rank of captain	510
Senior assistant surgeons, rank of first lieutenant	406
Junior assistant surgeons, rank of second lieutenant	100
Total	1,473

Added to these there are:

Pharmaceutical inspector, rank of brigadier-general	1
Senior chief pharmacists, rank of colonel	4
Junior chief pharmacists, rank of lieutenant-colonel	5
Senior pharmacists, rank of major	30
Junior pharmacists, rank of captain	45
Senior assistant pharmacists, rank of first lieutenant	20
Junior assistant pharmacists, rank of second lieutenant	10
Total	115

The administrative service consists of:

Principal administrative officers, rank of major	18
Administrative officers of the first class, rank of captain	140
Administrative officers of the second class, rank of first lieutenant	192
Administrative officers of the third class, rank of second lieutenant	
Total	350

Variations from the rule of promotion according to seniority may be made because of acts of special devotion or courage, or when it is imperative that vacancies be filled, and in all cases the time served in war or in the colonies is doubled in computing the length of service. The retiring age varies according to the grade, thus, colonels retire at 60, lieutenant-colonels at 58, majors at 56, captains at 53, and lieutenants at 52.

The pay proper of officers is as follows:

Major-generals	\$3,780	Majors	\$1,101
Brigadier-generals	2,520	Captains	612-830
Colonels	1,627	First lieutenants	504-540
Lieutenant-colonels	1,317	Second lieutenants	468

Soldiers.—The enlisted men under the command of the medical department are divided into nurses, clerks, and workmen, and company litter bearers. Of these

only the first class are directly under the personal command of medical officers, the second class is controlled by administrative officers (themselves under the command of medical officers), while the third, as a rule, are commanded by their own regimental superiors.

To each of the 25 army corps there is a section of military nurses, but the strength of this section depends upon the fiat of the minister for war, and varies greatly according to the time and the station. The composition of each section is as follows: Sergeant-major, sergeant-farrier, sergeant-clerk, sergeant instructor (in charge of property), corporal-farrier, corporal-clerk, and corporal instructor. The proportion of these noncommissioned officers is 1 sergeant and 2 corporals to each 13 privates. In addition there are 42 warrant officers, called adjutants, all of which are really under instruction. The privates are graded as clerks, workmen, tailors, shoemakers, buglers, and canteen stewards.

Company bearers are detailed in much the same way as was formerly done in our own service, but are divided into two classes, and their strength varies according to the peace or war footing of the army. On a war footing they constitute about 3 per cent of the force. The term of regular enlistment is five years, and the compulsory military service three.

Instructions.—The army medical school (Paris) is conducted on military principles, although for the purpose of giving assistant surgeons and pharmacists instruction in the theory and practice of the specialty of military medicine. For this purpose the Val-de-Grâce hospital is attached to it and placed under charge of the brigadier commanding the school (un médecin inspecteur), who reports directly to the minister for war. The school is governed by three boards of officers—of improvement, of administration, and of discipline. The course begins on the 1st of February of each year and continues for nine months, after which those student officers who have successfully passed the examination are commissioned junior assistant surgeons with rank of second lieutenants.

The school at Lyons is under the control of its own faculty, and has for its object (a) to make provision for obtaining sufficiency of army surgeons, (b) to supplement the studies of the candidates for the medical department of the army, (c) to give to these latter a certain amount of military training preparatory to their admission to the school of Paris. To meet the requirements of admission the candidate must be a French citizen between 17 and 23 years of age, must pay a yearly fee of a thousand francs, and must provide himself with his own outfit. In case of students "who prove a deficiency in the wealth of their family" half or whole scholarship may be granted by the minister for war. Especial emphasis is placed on the military character of the instruction, and students have their quarters and mess at the school.

There are schools for the study of military pharmacy at Bordeaux, Lille, Lyons, Montpellier, Nancy, Paris, and Toulouse, and pupils are allowed a choice among them. While under instruction they are attached to military hospitals, and placed under the command of medical officers.

The instruction of the enlisted personnel is military, technical, and professional in its nature, there being also special training for artificers. Men who are proficient in the care and management of steam apparatus, such as sterilizers, automobiles, laundry machines, and the like, receive the grade of corporal.

The military instruction extends over a period of six weeks under the personal command of an officer of the administrative service, who carries out the course prescribed by the medical officer. By an especial regulation the chief surgeon is directed to allow nothing to interfere with the course, and ordered to insure its continuance during succeeding hospital service (without regard to other duties) for at least two hours per week.

Following the period of military instruction, desirable men are selected for a "platoon for special instruction," which is designed to produce men who are trained nurses, clerks, officers' secretaries, and generally useful. Those possessing sufficient aptitude are made corporals, although in order to obtain promotion it is almost necessary that the men have had instruction at the school for mechanicians as well.

The "technical" instruction which follows is given only to graduates of the platoon of special instruction, and consists in a course of clerical work, hygiene, minor surgery, sterilization, baths, and bandaging. The training is both theoretical and practical and continues three months.

"Professional training" is given throughout the year to all the enlisted personnel on the general organization and the duties of the medical department with especial reference to field service, the care and transportation of sick and wounded, and the various duties required in hospital work. From this training there must be no absentees, and the orders on the subject enjoin that it be carried on "with great personal care and constant solicitude, not only with reference to immediate satisfactory

results, but always with especial thought and preparation for service in war." An a further course in professional training, certain men receive more advanced teaching in massage, medical bathing, and the care of steam apparatus.

Considering the care and attention to detail with which every part of the training of the recruit is guarded, the men of the hospital service with whom I conversed did not seem to have reached a high standard of fitness.

Field service.—As laid down by the regulations, the duties of the medical department in the field are (a) the provision, preparation, and execution of hygienic measures intended to preserve the good condition and health of the troops. It is expected to (b) attend the sick and wounded on the march and upon the field of battle; (c) to see that the sick and wounded are methodically selected out, both for the purpose of preserving the effective strength as well as to prevent crowding of the field operations; (d) to be responsible for the treatment of the slightly disabled on the spot, and those who from the gravity of their cases can not be moved; (e) to secure the rapid evacuation toward the rear of all other sick and wounded; (f) to take measures to combat epidemics and to protect the country against their importation; (g) to initiate measures for extending hospital establishments at the base, and to create new institutions in order to meet with satisfaction all the necessities arising from a state of war; (h) to assume charge of sanitary affairs during sieges, and to provide troops with medicines, dressings, and surgical supplies.

Field service is divided into the service of the front and that of the rear. The service of the front comprises whatever affects the marching personnel, while that of the rear includes all sanitary formations, "which although a part of the army do not march with the troops." These sanitary formations of the rear are exempt from control of the general commanding at the front.

Service of the front.—The service of the front includes the regimental detachment which gives aid in station, on the march, and during battle, the ambulance or dressing station, and the field hospitals. These latter are designed to relieve the dressing stations of their wounded during the evening of the fight, or at latest the next morning. They treat on the battlefield if necessary and practicable such wounded as can not be removed, thus often reinforcing the dressing stations; the whole idea being a motile organization controlled by the medical department, which is held responsible for its efficiency. In carrying out this idea each field hospital is regarded as a part of a general whole, and can either coalesce with others to form one of larger proportions, or, on the other hand, can divide into separate halves, each capable of remaining independent for an indefinite period. In the normal order of march the field hospitals form a special train of their own, immediately behind that of the subsistence department. When, however, the field hospitals are distributed throughout the divisions, they march ahead of the regimental trains and behind their guard.

Service of the rear.—The service of the rear is carried out along two distinct lines, first, the care of the disabled along the line of communication, thus including such field hospitals as are mobilized within the rear zone and contain wounded who can not be further removed. This use of field hospitals is, however, strongly condemned, and is resorted to only in exceptional cases, such as sudden epidemics, or on the breaking down of auxiliary or permanent institutions.

Charitable organizations are a recognized branch of relief, but they are governed by regular laws promulgated by the General Government, are under the direct command of the Medical Department of the Army, and from current report are business-like organizations devoid of hysterical manifestations. Their sphere of influence includes the whole service of the rear, but applies especially to the permanent institutions converted to military use.

All along the lines of communication are well-named "evacuation hospitals" made from railway stations, hotels, churches, or other buildings, and these are kept supplied from the base with material in excess of their needs, so that they may act as reserve depots. Whenever these hospitals are of a military character it is stipulated that they be made divisible, both as regards material and personnel. This personnel consists of regular, reserve, and volunteer medical officers, administrative officers, nurses, litter bearers, clergymen, teamsters, and various civilians. The evacuation hospital is understood to be a place for temporary treatment, and every effort is directed to keeping its beds ready to receive those from the front.

The second division of the service of the rear contains the hospitals and other institutions of the base, which in time of war are all under military control.

Transportation.—The following varieties of wheeled transportation are in use by the medical department:

Each regiment of infantry or of field artillery is provided with a 2-wheeled cart, which has a wheel brake, a lantern, and weighs about 300 pounds. This cart contains materials for 300 dressings, including half a dozen regimental panniers, a

10-liter canister, a 30-liter cask, a set of blanks, red and white lanterns, Red Cross and national flags, and certain other articles on racks depending on the arm of the service. These carts, although designed for a single animal, can be readily drawn by men and are designed for service at the rear front. Two recumbent patients can be crowded into one of them.

The 4-wheeled regimental wagon (not ambulance) is a strong, heavy vehicle, the front wheels of which are cut under, and which has a lamp and wheel brake on the right side, a canvas cover, and sufficient length of bed to carry 2 reclining patients in an emergency. It carries much the same supply as the cart, but in larger quantity.

The wagon for non-mounted personnel is a large covered 4-wheeled omnibus, having 4 windows in the sides, a high driver's seat in front, and padded seats within for 8 officers. This wagon, by means of which 2 horses transport 8 persons and their baggage, is distinctly of value.

The surgical wagon is intended to be drawn by 4 horses, has wooden sides and top, and weighs loaded 1,850 kilograms, of which 810 constitute the load. It has doors at the sides and rear, and carries an admirably arranged assortment of dressings, surgical instruments, medicines, and supplies. Every part of this material is readily accessible.

The administration wagon is also a 4-horse vehicle, with wooden sides and top, weighing 1,100 kilograms. As in all the wagons of this class, it is divided in two parts, and carries a complete office equipment, including records, blanks, and stationery. In the rear, but completely separated by a partition, are the mess supplies, kitchen furniture, water and wine tanks for a variable number of men.

The reserve baggage wagon of the medical department (*fourgon de service de santé*) is a well-made, strong, 4-wheeled vehicle, with wheel brake and lanterns, canvas covered on a wooden frame, high wooden sides, 3 steps at the rear, and platform springs. It can be used to carry sick in an emergency. Six of these wagons constitute a set, and are lettered, according to their contents, from A to F. Briefly, wagon A contains dressings, splints, 15 blankets, and a 50-liter cask. This carrying of receptacles for sterilized water or wine is considered of prime importance. Wagon B contains fracture pads, shirts, prepared lint, medicine in cases, ax, pick, spade, and crow. Practically everything is packed in panniers in all the wagons. Wagons C and D are attached to the headquarters of each corps, while each division has wagons A and B. C and D have identical contents, the idea being that either can be sent without delay to that part of the corps needing them most, and they contain complete operation, medical, and surgical supplies for 2 field hospitals, lanterns, flags, nose bags, casks, buckets, and material for the repair of harness. Wagon E carries the same supplies as F, namely, a hospital tent (20-13-8), 25 liters, buckets, 30 liters of brandy, and 50 liters of wine. In addition it carries officers' mess chests and a limited amount of their baggage.

Besides the above there are army wagons (*fourgons ordinaires*) used for carrying rations and other regular impedimenta. They do not seem as well made as our own escort wagon and are of about the same capacity. The steam sterilizer (system of Geneste and Herscher) is too heavy for transportation on American roads by less than 6 animals.

Of ambulances proper there are two principal models, the 2-wheeled carrying 2 recumbent patients and the 4-wheeled carrying 4. The former is light enough to be easily drawn by a single animal, and can go almost anywhere. The latter is not so good an ambulance as is our own as modified by Munson. I am informed that wounded are often preferably transported in the high French hay-wagon, which will take as many as 10 litters.

The wagon train when practicable is drawn by an automobile at a rate of between 3 and 4 miles an hour. This they find cheaper and more convenient than horses, and it is believed to be practicable for our own roads as well. The train of the medical department is a separate command—a divisible unit—under medical and administrative officers who have been trained for this line of work. The transportation for an army corps consists of the following, so far as the medical department is concerned:

Allowance of transportation for medical department of a corps.—With the headquarters of the corps: One wagon for personnel, 2 surgical wagons, 2 administrative wagons, 2 set reserve baggage wagons (A to F), 2 food wagons, 8 two-wheeled ambulances, and 6 four-wheeled ambulances.

To each of the divisions of infantry there are allowed the same, except that there are but 4 each of both two and four wheeled ambulances.

For the cavalry regiment of four squadrons: Two reserve baggage wagons, A and B, 3 two-wheeled ambulances, and 3 four-wheeled ambulances.

For each of the 8 field hospitals: Four reserve baggage wagons, A, B, C, and D.

For the hospital evacuation: Two complete field hospitals, 4 wagons containing 6,400 dressings, 3 improved sanitary trains, and 1 wagon for medical necessities.

Relative position of medical department in line of march.—The order of march of an army corps, if in a single column, is as follows:

Head of advance guard:

Cavalry.

Battalion of infantry.

Detachment of pioneers.

Body of advance guard (3½ miles long):

Headquarters first division.

Headquarters first brigade.

Two battalions of infantry.

Two batteries artillery.

Two regiments of infantry.

Medical service of the first brigade.

Camp equipment.

(One and one-half miles interval.)

Body of the column:

Corps headquarters.

Headquarters second brigade.

Battalion infantry.

Three batteries artillery.

Third and fourth regiments.

Medical service of the second brigade.

Engineer detachment.

Batteries of artillery in three groups (9½ miles).

Headquarters second division.

Engineers.

Headquarters third brigade.

Fifth and sixth regiments.

Six batteries.

Headquarters fourth brigade.

Seventh regiment.

One battalion of infantry.

Medical service of the second division.

Ammunition train in 9 sections.

Rear guard:

Four companies of infantry.

Cavalry.

Wagon trains and their guards:

Medical service of the corps.

Three field hospitals.

Regimental wagon trains.

Two companies of infantry.

Administrative convoy.

Five field hospitals.

Extra wagons and horses.

The above distances as given in *Service de Santé de l'Armée en Campagne*, page 143, are believed to be largely theoretical, and the time allowance of 3¼ miles an hour is assuredly so. The order of march of the medical department of a corps is as follows, and this column is said to be 600 yards in length:

Chief medical officer.

Chief of the first section.

Administrative officer in command of hospital corps.

Religious ministers.

Hospital corps (nurses), in two detachments.

Hospital corps (litter bearers) in two platoons.

Officers commanding train.

Veterinary surgeon.

Bugler and noncommissioned officers.

Wagon for unmounted officers.

Mules for litters and cacolets.

Four two-wheeled ambulances.

Three four-wheeled ambulances.

Surgical wagon.

Administrative wagon.

Three medical department wagons.

Commissary wagon.
 Workmen on foot.
 Thirty-five feet interval.
 Medical officer.
 Administrative officer.
 Third and fourth detachments of hospital corps (nurses).
 Third and fourth platoons of litter bearers.
 Officer commanding train.
 Bugler and noncommissioned officers.
 Mules for caicolets and litters.
 Four two-wheeled ambulances.
 Three four-wheeled ambulances.
 Surgical wagon.
 Administrative wagon.
 Three medical department baggage wagons.
 Commissary wagon.
 Unmounted personnel of the train.

In the French service everything pertaining to the subject of transportation is laid down in such an exact manner that in time of war it would seem that there would be little else to do than to carry out orders. For instance, on the subject of dressings and litters, the allowance transported by each military unit is definite, the total for a mobilized army corps being 18,870 dressings and 272 litters. The care and thoroughness of their regulations is admirable in its attention to details. Thus the maxima and minima loads are always noted, the speed of the wagon train is calculated, and each part of a load is either numbered or else there is notation on the floor or side of the vehicle to show its place. In the case of long trains each wagon bears its individual number, so that it has a definite place, and the change from animals to automobiles is made by simply slinging the pole of the wagon beneath them, and coupling them together. The driver retains his place in order to apply the brake and guide the vehicle.

Hospitals.—Hospitals vary in size from Val-de-Grâce, with its 1,137 beds, to that of Mont Louis, with but 27. The colonial hospitals, judging from their printed reports, are not only very large (those of 500 beds being rather numerous), but are very economically administered. The general classification is the same throughout the Republic, the classes being: Hors classe, as Val-de-Grâce and a few others mainly devoted to special work or to special classes of patients, and first, second, third, fourth, fifth, and sixth classes, according to their importance and financial allowances. The number of beds now varies widely in hospitals of the same class, but is approximately 80 beds for the sixth class and an increase of about 80 for each class above it. The allowance of personnel is also interesting; the various divisions of the men being medical officers, administrative officers, pharmacists, clerks, janitors, cooks, dispensers, property men, bath men, clergy, surgical orderlies, sergeant supervisor, canteen sergeant, outside orderlies, administrative officers' orderlies, gardeners, barbers, painters and whitewashers, clothing men, soldiers in charge of fuel and of lights, mattress makers, carpenters, locksmiths, plumbers, shoemakers, tailors, firemen, printers, waiters, and ward men. The noncommissioned officers are sergeant-major, sergeant, and corporal. With the exception of the noncommissioned officers, the above constitutes the permanent personnel of the hospital, the allowance of which (independently of the number of patients) is as follows: Val-de-Grâce, 77; first class, 53; second class, 45; third class, 35; fourth class, 29; fifth class, 22, and sixth class, 20.

Added to this is the variable personnel, which depends on the number of patients in the wards, and is:

For each ward	privates..	3
For each 3 officers treated	private..	1
For each 5 noncommissioned officers	do....	1
For each 8 soldiers	do....	1
For each medical or administrative officer on duty	do....	1
For each ward	noncommissioned officer..	1

To this number is then added 10 per cent to allow for men of the hospital corps who are on leave or sick and for the special care of the field outfit attached to every hospital.

The allowance of medical and administrative officers varies greatly, and there is a tendency to have a permanent and variable one here also. It is said that there is less rotation in station in our own service.

In regard to the actual work of the hospitals, the time at my disposal was too limited to give sufficient data on which to generalize. It chanced that the Val-de-

Grâce was visited on the day of their annual inspection, but the police of the building was not all that one would expect. The hospital corps seemed to me undersized and not well set up, but the commissioned officers presented a clean-cut, soldierly appearance decidedly above the average. Here, as elsewhere in Europe, mounted officers wear their spurs whenever on duty.

Conclusion.—Modern methods of warfare affect the medical department no less than the line and in various directions. The placing of a weapon in the hands of an infantryman which is effective to the limit of his vision has deepened the service of the front to such an extent that problems of first aid and transportation are more difficult than ever. The modern long thin line, without support, and with reserves only at great distance must necessarily expose the one staff department always under fire and demands extra personnel to provide for losses and to cover the increased space. The white brassard under certain conditions becomes a death warrant, for the soldier of to-day is not only the hunter but is also the game, and the uniform of the sanitary soldier must not differ conspicuously from that of those around him. The French medical department seems thoroughly alive to these changed conditions and is devoting thought and labor to the most important but almost undeveloped subject of the sanitary service of the zone of fire. With this end in view they lay particular stress on (a) military discipline, (b) a medical department trained in administrative work, (c) a soldierly personnel which can be relied on under fire, and (d) carefully thought-out provision for the transportation of men and supplies, designed to meet the exigencies of actual war.

CONCLUSION.

In concluding this, my last report as Surgeon-General of the Army, I desire to call attention briefly to some of the more important facts relating to the history of the Medical Department during the period of my service in this capacity. It has been my constant aim to maintain a high standard of professional attainment among the medical officers of the Army. With this end in view they have been liberally supplied with professional books and periodicals, and, so far as practicable, the younger members of the corps have been given stations where they would have opportunities for improving themselves professionally, and at the same time have been made to understand that the examinations required by law to be made in advance of their promotion to the grade of captain and major would be so rigid as to require their best efforts to keep *au courant* with the advancement of medical knowledge and its practical application. In order that medical officers who were approaching the time when they would be required to pass an examination for promotion to a majority might have an opportunity to prepare themselves for this examination, upon my recommendation the following regulation, which now constitutes paragraph 12 of the Manual for the Medical Department, edition of 1900, was approved by the honorable the Secretary of War in 1893:

The Surgeon-General will recommend the assignment as attending surgeons in the principal medical centers of the United States of medical officers who have not yet passed their examinations for promotion to a majority and, so far as may be practicable, in the order of their seniority. These details will be made for one year only, in order that as many medical officers as possible may be enabled to avail themselves of the opportunities thus offered for making themselves familiar with the practice of the leading physicians and surgeons in this country and of attending medical lectures, meetings of medical societies, etc. At the end of this tour of duty medical officers are required to make a detailed report to the Surgeon-General, showing how much of their time has been occupied by their official duties and to what extent they have availed themselves of the advantages offered for professional advancement.

For the instruction of medical officers recently appointed, the Army Medical School was established in this city June 24, 1893.

The course of instruction covers a period of five months, and is given annually at the Army Medical Museum in Washington, D. C., commencing on the first Monday

of November. It includes lectures on and practical instruction in (a) the duties of medical officers in war and peace. (b) Military surgery, the care of the wounded in time of war, and hospital administration. (c) Military hygiene. (d) Military medicine. (e) Microscopy, sanitary and clinical; pathological histology, bacteriology, and urinalogy. (f) Hospital Corps drill, and first aid to wounded.

Realizing that the best surgical work could not be expected from our medical officers unless they were supplied with the most modern and approved instruments and appliances, I have endeavored to make our equipment for surgical work, in hospitals or in the field, as complete as could be desired. I have insisted upon every hospital of any size being provided with a suitable operating room, furnished with all the appliances required for aseptic surgical work, and with a laboratory fitted up for such bacteriological, pathological, and chemical investigations as might be required in connection with clinical work, and also for carrying on original investigations for the advancement of medical science. As a result of this policy we have a considerable number of medical officers in the corps who are well fitted for undertaking original research work, and during the past two years results of the highest value have been attained by the boards, appointed upon my recommendation, for the study of tropical diseases in Cuba and in the Philippines. (See p. 714 and p. 740.) All of the members of these boards have given evidence of zeal and ability in the prosecution of the work assigned to them. The board in Cuba, of which Major Reed, surgeon, United States Army, is president, has attained results of the greatest value, and Major Reed is worthy of special commendation for the scientific acumen he has displayed in planning and carrying out the experiments which have led to the demonstration that yellow fever is transmitted from man to man by mosquitoes.

Dr. James Carroll, contract surgeon, United States Army, a member of this board, has also distinguished himself by his intelligent and self-sacrificing devotion to the investigation with which the board was charged. He first submitted himself to mosquito inoculation, and as a result suffered a severe attack of yellow fever. The credit due him is no less than that which has been universally awarded to his less fortunate colleague, Dr. Jesse W. Lazear, who died as a result of a similar inoculation.

First Lieut. Richard P. Strong, assistant surgeon, United States Army, and First Lieut. William J. Calvert, assistant surgeon, United States Army, members of the board for the study of tropical diseases in the Philippines, have made valuable contributions to our knowledge of these diseases, and especially of tropical dysentery and bubonic plague.

The selection resulting from a rigid entrance examination, together with the facilities afforded medical officers for maintaining a high standard of professional attainments, has given to the Army a medical corps of which it may well be proud, and, as a matter of fact, I believe that with few exceptions our medical officers enjoy the respect and esteem of their fellow-officers of the line, with whom they are most intimately associated and whose hardships and dangers they are called upon to share. In this, my final report, I desire to express my high appreciation of the services which have been rendered by the medical officers of the Army, of all grades, during and since the Spanish-American war, under conditions which have taxed to the utmost their physical and mental powers of endurance. The value of previous training and experience in the military service has been amply demonstrated, and it must be apparent to all who are familiar with facts that

trained medical officers are as essential to the well-being of an Army as trained soldiers, and that a practitioner of medicine or surgery, however well informed, has much to learn before he is fitted to assume the duties of a medical officer, especially in time of war.

Since my appointment new and modern hospitals have been built at the following-named posts: Washington Barracks, D. C., Fort McHenry, Md., Fort Myer, Va., Fort Wadsworth, N. Y., Fort Monroe, Va., Fort Hamilton, N. Y., Fort Hancock, N. J., Fort Snelling, Minn., Fort Slocum, N. Y., Fort Adams, R. I., Madison Barracks, N. Y., Fort Terry, N. Y., Fort Preble, Me., Fort Leavenworth, Kans., Fort Williams, Me., Fort Ontario, N. Y., Fort Washington, Md., Fort Keogh, Mont., Fort Robinson, Nebr., Fort Ethan Allen, Vt., Fort Crook, Nebr., Fort Meade, S. Dak., Plattsburg Barracks, N. Y., Fort Wright, Wash., Fort Baker, Cal., Fort H. G. Wright, N. Y., Fort Strong, Mass., and Great Diamond Island, Maine. These are brick buildings of an approved plan, and for the most part are heated by hot water. All are provided with operating rooms and laboratories.

The Army and Navy Hospital at Hot Springs has been greatly enlarged and improved, and upon my recommendation, approved by the President, discharged volunteer soldiers are now admitted for treatment. The commanding officer, Maj. George H. Torney, surgeon United States Army, deserves great credit for the energy and ability he has displayed in the management of this hospital.

The post hospital at Washington Barracks was made a general hospital, at my request, in September, 1898. It has recently been enlarged and now has a capacity of 50 beds. Many serious surgical cases have been successfully treated in this hospital, and it has proved most useful not only for the care of the sick and wounded, but also for the instruction of young medical officers attending the Army Medical School. Major W. C. Borden, the commanding officer, deserves great credit for his able administration of the affairs of the hospital and for the successful results attained in the treatment of a large number of serious surgical cases. Maj. H. O. Perley, surgeon, United States Army, has rendered most efficient services as commanding officer of the Army hospital ship *Relief*, which, under his able management, has proved to be of the greatest utility and has justly been considered a model hospital ship.

During the Spanish-American war, general hospitals were established at Fort Myer, Va., Fort Thomas, Ky., Fort McPherson, Ga., Key West, Fla., Fort Monroe, Va., Savannah, Ga., Chickamauga Park, Tenn., and at the Presidio, San Francisco, Cal. After the muster out of our Volunteer Army we were able to dispense with all of these general hospitals with the exception of that at the Presidio. This hospital, under the able management of Lieutenant-Colonel A. C. Girard, deputy surgeon-general, has served a most useful purpose in caring for our sick and wounded soldiers returning from the Philippines. I consider the Presidio General Hospital a model military hospital, and invite special attention to the interesting reports of Lieutenant-Colonel Girard, published in this volume (pp. 616 to 663 and 826 to 835), which give a full account of the medical and surgical work accomplished during the fiscal year ending June 30, 1901.

An account of our hospital for the treatment of cases of tuberculosis will be found on page 551. This hospital was established in 1899, and has proved to be of inestimable value for the treatment of the victims

of pulmonary tuberculosis, and also enables us to remove these cases promptly from the wards of general and post hospitals, thus greatly reducing the chances of the propagation of the disease among our soldiers. Maj. Daniel M. Appel, surgeon, United States Army, has been indefatigable in his efforts to make this a model sanitarium and in his attention to the interests of the sick under his care.

I also invite attention to that portion of this report which relates to the operation for the radical cure of hernia (pp. 782 to 788). The policy of operating upon soldiers for the radical cure of hernia, and thus retaining their services in the ranks instead of discharging them, to become pensioners, has been attended with most favorable results. It has also given army surgeons an opportunity to demonstrate their skill in the performance of a difficult operation and to show that the results of their surgical work compare favorably with the best results obtained by the leading surgeons in civil life. The same is true as regards operations for appendicitis and emergency surgery generally.

The appropriation for the Medical Department prior to the Spanish-American war varied from \$170,000 in 1893 to \$140,000 in 1897. With these small appropriations it was impracticable to accumulate a reserve supply for any sudden emergency which might arise, and after the declaration of war in 1898, so soon as funds were available, it became necessary to purchase the field equipment required by our Volunteer Army of 250,000 men. The manufacture of medical chests and of the various articles pertaining to the field equipment of a regiment required time, and in spite of every effort to expedite the manufacture and delivery of these necessary articles many regiments were obliged to wait for some weeks before they received their full field equipment. This was the cause of much dissatisfaction and unfavorable criticism of the Department, but under the circumstances was entirely unavoidable. Constant efforts have been made to perfect our field equipment, and I am informed by medical officers attached to our forces in China during the recent military operations in that country that it was generally recognized as being superior to that of any other nation. At present our enlarged supply depots are filled with medical supplies of all kinds, and it is the policy of the Department to keep on hand at all times a field outfit sufficient for the immediate supply of at least 100,000 men in addition to those now in service. Before the Spanish-American war my most reasonable estimates for the Medical Department were frequently reduced by Congress, and barely enough money was appropriated to meet current expenses. But since that time appropriations have been liberal, as will be seen by the following figures: 1897, \$140,500; 1898, \$135,200; 1899, \$2,765,000; 1900, \$1,500,000; 1901, \$2,000,000.

While the officers of the Medical Department, the volunteer medical officers, and contract surgeons in the service have as a rule rendered faithful and satisfactory services, I consider it my duty to call special attention to the services of a few of those who have occupied positions of the greatest responsibility.

Col. Chas. R. Greenleaf, assistant surgeon-general, chief surgeon Division of the Philippines, has administered the affairs pertaining to the medical department in that division with conspicuous ability. Col. Wm. H. Forwood, assistant surgeon-general, chief surgeon Department of California, has occupied a position only second in importance to that of the chief surgeon in the Philippine Islands, as all troops

going to or returning from these islands are detained for a greater or less length of time in San Francisco, and a large number of sick soldiers are brought to that city by returning transports. He has been most faithful and zealous in the performance of his responsible duties, and has given evidence of excellent executive ability, not only as chief surgeon of an important department, but as acting Surgeon-General of the Army during my absence on an inspecting trip in the Philippines.

Col. Justus M. Brown, assistant surgeon-general, has performed the duties of medical supply officer in New York City, during and since the Spanish-American war, in a most creditable and satisfactory manner. Col. Charles Smart, assistant surgeon-general, in charge of the sanitary division of my office, has, as usual, performed the important duties devolving upon him with untiring zeal and distinguished ability. Col. Calvin De Witt, assistant surgeon-general, in charge of the museum and library division of my office and president of the army medical examining board in this city, has performed all of the duties pertaining to these responsible positions in a most satisfactory manner. Maj. Valery Havard, chief surgeon, Department of Cuba, has administered the affairs of the Medical Department in that island in a most intelligent and creditable manner. Maj. John Van R. Hoff, surgeon, United States Army, having made an excellent record as chief surgeon in Porto Rico, was selected by me as chief surgeon of the China relief expedition, but upon his arrival in China hostilities were over, and at my request he was ordered to this city for duty in my office. He was placed in charge of the Hospital Corps division and of the supply depot at the Army Medical Museum and has performed all of the duties devolving upon him with zeal and ability. Maj. William B. Banister, surgeon, United States Army, accompanied the troops from Manila to China and acted as chief surgeon of the expedition until the arrival of Maj. Francis J. Ives, surgeon, United States Army, on September 25, 1900, who continued to act as chief surgeon until the withdrawal of all of our troops with the exception of a legation guard. These medical officers distinguished themselves by their efficient management of the affairs of the Medical Department during the expedition to China and the occupation of Pekin.

Mrs. Dita H. Kinney was appointed superintendent of the female nurse corps in March, 1901. She has given evidence of an intelligent appreciation of the interests of the female nurse corps and of the service, of excellent judgment and of administrative ability.

I desire also to testify to the excellent services rendered, not only during the past year, but for many years, by some of the senior clerks in my office. The following named are worthy of special commendation on account of their zealous and efficient performance of the duties assigned them: Mr. George A. Jones, chief clerk; Mr. Joseph R. Rose, assistant to chief clerk; Mr. T. A. Haviland, in charge of records; Mr. B. F. Williams, in charge of correspondence; Mr. B. B. Thompson, in charge of accounts; Mr. D. G. Dixon, chief clerk supply division; Mr. A. M. Buck, chief clerk sanitary and disbursing division; Mr. W. H. Degges, in charge of statistical section; Mr. R. Ravenburg, chief clerk hospital corps division; Mr. C. J. Myers and Mr. F. W. Stone, of the museum and library division. Mr. Frank Coburn, who has been my personal stenographer and typewriter during the entire period of my incumbency of the office of Surgeon-General, has performed his responsible duties in a most satisfactory manner, and I desire to testify as to my appreciation of his efficient and faithful services.

In conclusion, I desire to ask for the medical corps of the Army the kindly interest of the Congress of the United States, of the honorable the Secretary of War, and of all general officers of the Army. History has amply demonstrated the fact that infectious diseases are often more fatal to the success of armies than the military operations of the enemy. Modern sanitary science justly claims that infectious diseases, such as smallpox, typhoid fever, yellow fever, cholera, bubonic plague, etc., are to a large extent preventable diseases. Special attention is given in the examination of candidates for the medical corps and in their subsequent training at the Army Medical School to questions relating to the cause and prevention of infectious diseases and to hygiene in general, and they are constantly made to feel their responsibility as guardians of the health of the commands to which they are attached. Evidently the prevention of disease among our soldiers is of paramount importance, and the medical corps can point with pride to the great reduction in the mortality and nonefficiency rates among our troops during the period from 1866 to 1897. Unfortunately, this record was broken during the Spanish-American war by the epidemic prevalence of typhoid fever in nearly all of our camps within the limits of the United States. The causes for this discreditable state of affairs are set forth in my paper entitled "Sanitary lessons of the war" (published in 1899), from which I beg leave to quote the following passages:

The medical officers of regiments were appointed by the governors of States and, as a rule, were competent professionally, but they were called upon to assume new responsibilities for which they had no special training. Unfortunately, hygiene and practical sanitation are subjects which receive little attention in our medical schools or from physicians and surgeons engaged in the practice of medicine. But even in those cases in which the regimental surgeon was fully aware of the importance of camp sanitation and urgent in his sanitary recommendations he was unable to control the sanitary situation unless the regimental and company officers enforced the necessary measures for protecting the health of the command. And just here is the fundamental difficulty when we are dealing with new levies of troops. The officers and enlisted men of our volunteer regiments were, as a rule, intelligent, patriotic, and brave, but they were not disciplined. Each man was in the habit of judging for himself and of acting in accordance with his individual judgment. Discipline consists essentially in an unquestioning obedience of orders from those having proper authority to give them. Trained officers can not at once establish discipline among untrained troops, and when both officers and enlisted men are without military experience it is evident that, with the best material, time will be required for the establishment of discipline, and in the absence of discipline it is impracticable to enforce proper sanitary regulations in camp. The Surgeon-General may formulate sanitary regulations and the general commanding an army corps or a division may issue the necessary orders, but in the absence of discipline these orders will not be enforced. A reckless recruit will drink the water which has been condemned as unsafe and at night will defile the ground in the vicinity of his tent rather than visit the company sink, which, possibly, is in a disgusting and unsanitary condition because of a failure to carry out the orders to cover the surface of excreta "with fresh earth or quicklime or ashes three times a day."

New levies of troops are especially subject to typhoid fever and other infectious camp diseases, not only because of a lack of discipline and consequent difficulty in the enforcement of necessary sanitary regulations, but also because the individual soldiers are very susceptible to infection, owing to their age, the abrupt change in their mode of life, the exposure and fatigue incident to camp life, and last, but not least, their own imprudence as regards eating, drinking, exercise, etc.

The value of experience and special training is recognized in all departments of human activity, and the military calling furnishes no exception to the general rule. This applies to the staff as well as to the line, and the medical staff is no exception. When, therefore, I say that the evils resulting from neglect of camp sanitation during the earlier months of the war were to some extent due to the inexperience of the regimental surgeons, I am not reflecting upon the professional qualifications of these gentlemen, but am simply stating a fact.

There has been no failure upon the part of the medical department of the volunteer army to accomplish all that could have been reasonably expected of it, but without doubt an adequate number of thoroughly trained medical officers could have done much at the outset of the war in the way of preventing the introduction and extension of typhoid fever in our camps, and in organizing and administering field hospitals, ambulance companies, etc.

Finally, the principal lessons to be derived from our recent experience may be stated as follows:

A trained medical corps, hardly adequate for an army of 25,000 men, can not control the sanitary situation when this army is quickly expanded to 250,000. Physicians and surgeons from civil life, however well qualified professionally, as a rule are not prepared to assume the responsibilities of medical officers charged with administrative duties and the sanitary supervision of camps. The proper performance of such duties can not be expected from a physician without military training or experience, no matter how distinguished a position he may have held in civil life.

Courage and patriotism on the part of line officers and enlisted men can not take the place of knowledge and experience; new levies of troops are, as a rule, ignorant of the first principles of camp sanitation and reckless as to the consequences of their neglect of prescribed sanitary regulations. Therefore training and discipline are essential factors in the preservation of the health of soldiers in garrison or in the field.

The value of the aphorism "In time of peace prepare for war" has received additional support. This preparation should include a corps of trained medical officers larger than is absolutely necessary for the Army on a peace basis, and systematic instruction in military medicine and hygiene for the medical officers of the National Guard as well as for those of the Regular Army; also instruction of line officers in the elements of hygiene and especially in camp sanitation. It should also include the establishment of camping grounds in various parts of the country, having an ample supply of pure water, a proper system of sewers, etc. If our volunteers could have been assembled in such camps during the late war a saving in lives and money would have resulted which would without doubt have demonstrated the economy of such preparation for war in time of peace.

With reference to the subsequent sanitary history of our troops, I again point with pride to the reports in the present volume relating to health conditions in the United States, and especially in our island possessions. I believe that new levies of troops serving in a tropical country have never, in the history of the world, had so good a health record as that shown by these reports for the troops stationed in the Philippine Islands, in Cuba, and in Porto Rico. My recent inspecting trip to the Philippine Islands has convinced me that when proper sanitary regulations are enforced the health of troops stationed in these islands will be quite as good as if they were stationed in our own "Gulf States." I would say further, with reference to this trip, that I found wherever I went well-equipped hospitals, ample and efficient medical attendance, and an abundance of medical supplies of all kinds.

STATISTICAL TABLES.

The following statistical tables give in detail the data on which the statements of this report are based. They are:

I. Numerical view of the effects of disease and injury on the Army during the calendar year 1900, as compared with the corresponding data for 1899 and for the decade 1889-1898.

II. Numerical view of the effects of disease and injury on the United States forces doing insular and home service in 1900, as compared with corresponding data for 1899.

III. Armies, Regular and Volunteer, 1900; admissions to sick report, discharges, and deaths from various causes, with their ratios per thousand of mean strength, as compared with the corresponding ratios of the Regular Army for the decade 1889-1898.

IV. Armies, Regular and Volunteer, 1900; admissions to sick report, discharges, and deaths from various causes, with their ratios per thousand of mean strength, arranged by the countries in which service was rendered. (All the volunteer troops in service during the year were on duty in the Division of the Philippines.)

V. Armies, Regular and Volunteer, 1900; admissions to sick report, discharges, and deaths from various causes, with their ratios per thousand of mean strength, arranged by arms of the service.

INTERNATIONAL TABLES.

I. Examination of recruits during the year 1900.

III. Movements of sick by branches of military service and by months, Volunteers and Regulars, 1900.

VI. Admissions of important diseases by branches of the military service, Volunteers and Regulars, 1900.

VII. Admissions of important diseases by months, absolute numbers, Volunteers and Regulars, 1900.

It has not been practicable during the past year to gather the data necessary for the presentation of Tables II, IV, V, and VIII of the international series.

TABLE I.—Numerical view of the effects of disease and injury on the Army during the calendar year 1900, as compared with the corresponding data for 1899 and for the decade 1889-1898.

United States Army.						
	Volunteers.	Regulars.	Total.	White.	Colored.	Indian.
Mean strength.....	31,434	68,965	100,399	92,374	8,015	
Total admissions to sick report.....	92,102	139,978	232,080	217,319	14,761	
Per 1,000 of mean strength.....	2,930.01	2,029.99	2,311.81	2,352.40	1,741.47	
Per 1,000 for previous year.....	1,622.83	2,342.26	2,178.04	2,176.47	2,214.88	
Per 1,000 for preceding decade.....		1,280.19	1,280.19	1,280.87	1,288.60	1,115.42
Admissions from disease.....	86,514	125,583	212,097	199,340	12,757	
Per 1,000 of mean strength.....	2,751.79	1,820.94	2,115.54	2,137.97	1,628.57	
Per 1,000 for previous year.....	1,407.28	2,125.74	1,895.51	1,896.51	1,972.06	
Per 1,000 for preceding decade.....		1,047.44	1,047.44	1,050.52	1,053.74	832.16
Admissions from injury.....	5,588	14,415	19,703	17,979	1,724	
Per 1,000 of mean strength.....	168.23	209.05	184.27	194.63	215.10	
Per 1,000 for previous year.....	116.05	216.52	192.43	188.95	242.40	
Per 1,000 for preceding decade.....		232.75	232.75	229.85	259.86	283.28
Discharges for disability, all causes.....	408	1,861	2,269	2,133	136	
Per 1,000 of mean strength.....	12.98	26.99	22.60	23.09	16.97	
Per 1,000 for previous year.....	12.70	27.42	21.98	21.98	21.99	
Per 1,000 for preceding decade.....		14.79	14.79	14.74	14.43	24.21
Discharges from disease.....	321	1,457	1,778	1,670	108	
Per 1,000 of mean strength.....	10.21	21.13	17.71	18.08	13.47	
Per 1,000 for previous year.....	10.45	21.65	17.51	17.50	17.65	
Per 1,000 for preceding decade.....		11.68	11.63	11.62	11.47	21.57
Discharges from injury.....	87	404	491	463	28	
Per 1,000 of mean strength.....	2.77	5.86	4.89	5.01	3.49	
Per 1,000 for previous year.....	2.25	5.77	4.47	4.48	4.34	
Per 1,000 for preceding decade.....		3.10	3.10	3.12	2.96	2.64
Deaths from all causes.....	1,138	1,145	2,283	2,105	178	
Per 1,000 of mean strength.....	36.20	16.61	22.74	22.79	22.21	
Per 1,000 for previous year.....	7.26	18.65	18.43	18.55	16.64	
Per 1,000 for preceding decade.....		9.83	9.83	9.68	10.77	16.72
Deaths from disease.....	784	901	1,685	1,465	220	
Per 1,000 of mean strength.....	24.94	11.62	15.79	15.96	14.97	
Per 1,000 for previous year.....	6.82	12.75	11.76	11.95	10.42	
Per 1,000 for preceding decade.....		7.08	7.08	7.01	7.65	9.68
Deaths from injury.....	354	344	698	640	58	
Per 1,000 of mean strength.....	11.26	4.99	6.95	6.98	7.24	
Per 1,000 for previous year.....	94	5.90	6.67	6.70	6.22	
Per 1,000 for preceding decade.....		2.74	2.74	2.67	3.12	7.04

TABLE II.—Numerical view of the effects of disease and injury on the United States forces doing insular and home service in 1900, as compared with corresponding data for 1899.

	Cuba.	Porto Rico.	Pacific Islands.		China.	Total Islands and China.		United States (continental).
			Volunteers.	Regulars.		Volunteers.	Regulars.	
Mean strength.....	8,690	2,180	31,434	35,444	1,947	31,434	48,265	79,699
Total admissions to sick report.	16,277	3,440	92,102	83,260	5,789	92,102	108,716	200,818
Per 1,000 of mean strength.	1,873.07	1,577.98	2,930.01	2,348.79	2,947.61	2,930.01	2,522.49	2,519.70
Admissions for disease.....	13,784	2,622.40	2,065.65	2,630.92	2,396.52	2,065.65	2,732.99	2,515.65
Per 1,000 of mean strength.	1,566.19	1,217.71	2,761.79	2,197.73	2,462.83	2,761.79	2,068.75	1,986.62
Admissions for injury.....	2,493	2,537.98	1,859.21	2,454.10	2,206.36	1,959.57	2,519.33	2,342.09
Per 1,000 of mean strength.	286.88	893	5,294	5,355	10,643	5,294	8,468	14,156
Discharges for disability, all causes.	211.76	180.27	168.23	151.06	159.13	168.23	163.74	177.62
Per 1,000 of mean strength.	24.3	266.43	506.44	176.82	189.16	181.27	213.66	200.91
Discharges for disease.....	16.57	33	408	796	18	408	1,048	1,456
Per 1,000 of mean strength.	1.9	15.14	12.98	22.46	38.52	12.98	21.71	18.27
Discharges for injury.....	115	19.85	14.92	19.89	17.82	13.96	21.79	39.29
Per 1,000 of mean strength.	13.23	30	321	604	925	321	784	26.95
Deaths from all causes.....	3.34	1.38	2.77	5.42	4.17	2.77	5.47	6.77
Per 1,000 of mean strength.	3.99	3.22	3.30	5.63	4.66	3.30	5.52	4.36
Deaths from disease.....	9.78	5.05	36.20	22.15	28.75	36.20	20.38	26.63
Per 1,000 of previous year.	18.30	11.27	29.83	31.10	30.58	25.18	25.76	25.53
Deaths from injury.....	78	11	784	571	46	784	701	1,485
Per 1,000 of mean strength.	8.40	5.05	24.94	16.11	20.26	24.94	14.52	18.63
Deaths from previous year.	16.36	9.12	11.80	17.40	15.30	12.77	16.89	15.77
Deaths from injury.....	12	.....	354	214	47	354	293	637
Per 1,000 of mean strength.	1.38	.....	11.26	6.04	4.49	11.26	5.86	7.99
Per 1,000 of previous year.	1.94	2.15	16.03	13.30	15.28	12.41	8.87	10.26

TABLE III.—*Armies, Regular and Volunteer, 1900—Admissions to sick report, discharges, and deaths from various causes, with their ratios per thousand of mean strength, as compared with the corresponding ratios of the Regular Army for the decade 1889-1898.*

Year 1900.	Army, Regulars and Volunteers.						White troops, Regulars and Volunteers.						Colored troops, Regulars and Volunteers.					
	100,389						92,374						8,015					
	Number.	Ratio.	Discharges.	Ratio.	Deaths.	Ratio.	Number.	Ratio.	Admissions.	Ratio.	Deaths.	Ratio.	Number.	Ratio.	Admissions.	Ratio.	Deaths.	Ratio.
Causes of admission to sick report.																		
Scarlet fever.....	6	0.06			1	0.01			6	0.06								
Measles.....	568	5.66			7	.07			543	5.88					25	3.12		
Smallpox.....	261	2.60			114	1.14			176	1.91					85	10.60	41	5.12
Vaccinia.....	2,036	20.28							1,911	20.69					125	15.60		
Influenza.....	1,632	16.26			1	.01			1,582	17.13					50	6.24		
Dengue.....	3,321	33.08							3,249	35.17					72	8.98		
Mumps.....	569	5.67							522	5.65					47	5.86		
Diphtheria.....	45	.45			4	.04			43	.47					2	.25		
Typhoid fever.....	978	9.74	3	0.03	164	1.63			943	10.21	3	0.03			31	3.87	10	1.25
Yellow fever.....	144	1.43			32	.32			148	1.60								
Cerebrospinal fever.....	11	.11			10	.10			11	.12								
Malarial fever, intermittent.....	55,814	555.98	2	.02	25	.25			52,689	569.31	2	.02			3,225	402.37		
Malarial fever, remittent.....	11,831	117.85			96	.96			11,355	122.92					476	59.39		
Malarial fever, pernicious.....	220	2.19	1	.01	15	.15			210	2.27	1	.01			10	1.25	2	.25
Malarial cachexia.....	3,062	30.50	40	.40	2	.02			2,957	32.01	39	.42			105	13.10	1	0.12
Fever, undetermined.....	2,223	22.15			2	.02			2,088	22.60					135	16.84		
Erysipelas.....	105	1.05			1	.01			101	1.09					4	.50		
Septicæmia and tetanus.....	32	.32			20	.20			27	.29					5	.62	1	.12
Rheumatic fever.....	433	4.31	2	.02	1	.01			399	4.32	2	.02			84	4.24	1	.12
Consumption.....	494	4.92	137	1.36	96	.96			448	4.85	123	1.33			46	5.74	14	1.75
Cancer.....	16	.16	3	.03	1	.01			16	.17	3	.03						
Gonorrhea and results.....	1,589	15.83	174	1.73	5	.05			1,463	15.84	160	1.73			126	15.72	14	1.75
Syphilis and results.....	7,899	78.69	58	.58					7,223	78.19	55	.60			676	84.33	3	.37
Chancroid and results.....	3,990	39.45	5	.05	1	.01			3,524	38.15	2	.02			436	54.40	3	.37
Infections, other.....	153	1.52	9	.09	6	.06			142	1.54	9	.10			11	1.37	2	.25
Total infectious diseases.....	97,402	970.24	435	4.33	602	6.00			91,676	992.43	400	4.33			5,726	714.41	35	4.37
Agonia.....	496	4.94	4	.04	6	.06			486	5.26	3	.03			10	1.25	1	.12
Malnutrition, others.....	114	1.14	56	.56	1	.01			110	1.19	54	.58			4	.50	2	.25
Total diseases of nutrition.....	610	6.08	60	.60	7	.07			596	6.45	57	.62			14	1.75	3	.37

TABLE II.—Numerical view of the effects of disease and injury on the United States forces doing insular and home service in 1900, as compared with corresponding data for 1899.

	Cuba.	Porto Rico.		Pacific Islands.		China.	Total Islands and China.		United States (conditional).
		Volunteers.	Regulars.	Total.	Volunteers.		Regulars.	Total.	
Mean strength.....	8,690	2,180	31,434	35,448	68,882	1,947	31,434	48,285	79,699
Total admissions to sick report.....	16,277	3,440	92,102	83,260	175,362	5,789	92,102	108,716	200,818
Per 1,000 of mean strength.....	1,873.07	1,577.98	2,930.01	2,348.79	2,621.96	2,947.61	2,930.01	2,522.49	2,519.70
Per 1,000 of previous year.....	2,749.74	2,622.40	2,065.65	2,630.92	2,886.52	2,947.61	2,190.87	2,782.99	2,515.65
Admissions for disease.....	13,784	3,047	86,814	77,965	164,719	5,112	86,814	99,848	186,662
Per 1,000 of mean strength.....	1,568.19	1,397.71	2,761.79	2,197.73	2,462.83	2,625.58	2,761.79	2,068.75	2,342.09
Per 1,000 of previous year.....	2,587.98	2,255.97	1,850.21	2,454.10	2,206.36	2,625.58	1,999.57	2,519.33	2,314.74
Admissions for injury.....	2,493	393	5,288	5,355	10,643	627	5,288	8,868	14,156
Per 1,000 of mean strength.....	286.88	180.27	168.23	151.06	159.13	322.03	168.23	183.74	177.62
Per 1,000 of previous year.....	211.76	286.43	206.44	176.82	189.16	322.03	181.37	213.66	200.91
Discharges for disability, all causes.....	114	33	408	796	1,204	75	408	1,048	1,456
Per 1,000 of mean strength.....	16.57	15.14	12.98	22.46	17.82	38.52	12.98	21.71	18.27
Per 1,000 of previous year.....	20.25	19.85	14.92	19.89	17.82	38.52	13.96	21.79	18.71
Discharges for disease.....	115	30	321	604	925	35	321	784	1,105
Per 1,000 of mean strength.....	13.23	13.76	10.21	17.04	13.83	17.98	10.21	16.24	13.86
Per 1,000 of previous year.....	16.26	16.63	11.62	14.26	13.16	17.98	11.40	16.26	14.35
Discharges for injury.....	29	3	87	192	279	40	87	264	351
Per 1,000 of mean strength.....	3.34	1.38	2.77	5.42	4.17	20.54	2.77	5.47	4.40
Per 1,000 of previous year.....	8.99	3.22	3.30	5.63	4.06	20.54	2.58	5.52	4.36
Deaths from all causes.....	85	11	1,138	785	1,923	93	1,138	984	2,122
Per 1,000 of mean strength.....	9.78	5.05	36.20	22.15	28.75	47.76	36.20	20.39	26.63
Per 1,000 of previous year.....	18.80	11.27	29.83	31.10	30.58	47.76	25.18	25.76	25.53
Deaths from disease.....	78	11	784	571	1,355	46	784	701	1,485
Per 1,000 of mean strength.....	8.40	6.05	24.94	16.11	20.26	23.62	24.94	14.52	18.63
Per 1,000 of previous year.....	16.36	9.12	11.80	17.80	15.30	23.62	12.77	16.89	15.27
Deaths from injury.....	12	.....	354	214	568	47	354	293	687
Per 1,000 of mean strength.....	1.38	.....	11.26	6.04	8.49	24.14	11.26	5.96	7.99
Per 1,000 of previous year.....	1.94	2.16	18.03	13.30	15.28	24.14	12.41	8.87	10.26

TABLE III.—*Armies, Regular and Volunteer, 1900—Admissions to sick report, discharges, and deaths from various causes, with their ratios per thousand of mean strength, as compared with the corresponding ratios of the Regular Army for the decade 1889-1898.*

Causes of admission to sick report.	Army, Regulars and Volunteers.						White troops, Regulars and Volunteers.						Colored troops, Regulars and Volunteers.					
	100,389						92,374						8,015					
	Number.	Ratio.	Number.	Ratio.	Deaths.	Ratio.	Number.	Ratio.	Number.	Ratio.	Deaths.	Ratio.	Number.	Ratio.	Number.	Ratio.	Deaths.	Ratio.
Scarlet fever.....	6	0.06	1	0.01	1	0.01	6	0.06	1	0.01	1	0.01	26	3.12	41	5.12		
Measles.....	568	5.66	114	1.14	73	0.73	543	5.88	73	0.79	1	0.01	25	3.12	41	5.12		
Smallpox.....	261	2.60	114	1.14	1	0.01	176	1.91	1	0.01	1	0.01	85	10.60	125	15.60		
Vaccinia.....	2,036	20.28	1	0.01	1	0.01	1,911	20.69	1	0.01	1	0.01	125	15.60	125	15.60		
Influenza.....	1,632	16.26	1	0.01	1	0.01	1,582	17.13	1	0.01	1	0.01	50	6.24	72	8.98		
Dengue.....	3,321	33.08	1	0.01	1	0.01	3,249	35.17	1	0.01	1	0.01	47	5.86	47	5.86		
Mumps.....	569	5.67	4	0.04	4	0.04	522	5.65	4	0.04	4	0.04	2	2.50	2	2.50		
Diphtheria.....	45	0.45	32	0.32	32	0.32	43	0.47	32	0.32	32	0.32	31	3.87	31	3.87		
Typhoid fever.....	978	9.74	3	0.03	164	1.63	943	10.21	3	0.03	154	1.67	10	1.25	10	1.25		
Yellow fever.....	144	1.43	10	0.10	10	0.10	148	1.60	10	0.11	10	0.11						
Cerebrospinal fever.....	11	0.11	2	0.02	2	0.02	11	0.12	2	0.02	2	0.02						
Malarial fever, intermittent.....	55,814	555.98	25	0.25	25	0.25	52,589	529.31	25	0.25	25	0.25	3,225	402.37	3,225	402.37		
Malarial fever, remittent.....	11,831	117.85	2	0.02	2	0.02	11,355	122.92	2	0.02	2	0.02	3,225	402.37	3,225	402.37		
Malarial fever, pernicious.....	11,220	112.20	1	0.01	1	0.01	11,210	122.92	1	0.01	1	0.01	3,225	402.37	3,225	402.37		
Malarial cachexia.....	3,062	30.50	40	0.40	40	0.40	2,957	32.01	39	0.42	15	0.16	106	13.10	1	0.12		
Fever, undetermined.....	2,223	22.15	2	0.02	2	0.02	2,088	22.60	2	0.02	2	0.02	135	16.84	1	0.12		
Erysipelas.....	105	1.05	1	0.01	1	0.01	101	1.09	1	0.01	1	0.01	4	5.00	4	5.00		
Septicæmia and tetanus.....	32	0.32	1	0.01	1	0.01	27	0.29	1	0.01	1	0.01	5	6.25	5	6.25		
Rheumatic fever.....	433	4.33	2	0.02	2	0.02	432	4.32	2	0.02	2	0.02	34	4.25	34	4.25		
Pneumonia.....	494	4.92	137	1.36	96	0.96	448	4.85	123	1.33	84	0.91	46	5.74	14	1.75	12	1.50
Cancer.....	16	0.16	3	0.03	3	0.03	16	0.17	3	0.03	3	0.03	1	1.25	1	1.25		
Gonorrhea and results.....	1,589	15.89	174	1.73	5	0.05	1,463	15.84	160	1.73	5	0.05	126	15.72	14	1.75		
Gonorrhea and results.....	7,899	78.99	58	0.58	1	0.01	7,223	78.19	55	0.60	1	0.01	676	84.33	3	3.75		
Gonorrhea and results.....	3,960	39.60	5	0.05	1	0.01	3,524	38.15	2	0.02	2	0.02	436	54.40	3	3.75		
Infections, other.....	153	1.52	9	0.09	6	0.06	142	1.54	9	0.10	4	0.04	11	1.37	2	2.50		
Total infectious diseases.....	97,402	970.24	435	4.33	602	6.00	91,676	992.43	400	4.33	526	5.69	5,726	714.41	35	4.37	76	9.48
Anemia.....	496	4.94	4	0.04	6	0.06	486	5.26	3	0.03	6	0.06	10	1.25	1	1.25		
Nutrition, others.....	114	1.14	56	0.56	1	0.01	110	1.19	54	0.58	1	0.01	4	5.00	2	2.50		
Total diseases of nutrition.....	610	6.08	60	0.60	7	0.07	596	6.45	57	0.62	7	0.08	14	1.75	3	3.75		

Kidneys, diseases of	370	3.69	32	47	342	3.70	31	34	44	48	28	3.49	1	12	3	37
Varicocele	392	3.91	21	381	1,071	11.59	20	22	1	01	11	1.37	2	25		
Genito-urinary, others	1,168	11.64	22	1	1,071	11.59	20	22	1	01	97	12.10	2	25		
Total diseases of the genito-urinary system	1,930	19.23	75	48	1,794	19.42	72	78	45	49	136	16.97	3	37	3	37
Adenitis	742	7.39	5	05	673	7.39	4	04			69	8.61	1	12		
Lymphatic system, others	97	.97	3	03	90	.97	2	02	1	01	7	.87	1	12		
Total diseases of the lymphatic system	839	8.36	8	08	763	8.26	6	06	1	01	76	9.48	2	25		
Rheumatism, muscular	3,989	39.74	22	22	8,505	87.95	20	22			484	60.39	2	25		
Osteitis and periostitis	3,193	31.92	8	08	1,174	1.88	7	08			119	2.37	1	12		
Arthritis and synovitis	982	9.28	26	26	831	9.00	24	26	1	01	103	12.60	2	25		
Rheumatism, chronic articular	676	6.76	66	66	593	6.42	60	63			83	10.35	6	75		
Muscles, bones, and joints, others	452	4.50	50	50	412	4.46	44	48			40	4.99	6	75		
Total diseases of the muscles, bones, and joints	6,242	62.18	172	1.71	5,515	59.71	155	1.68	1	01	727	90.70	17	2.12		
Total diseases of the integumentary system	18,856	187.84	10	10	17,880	193.58	8	09	1	01	976	121.77	2	25		
Total diseases of the eye	1,628	15.22	45	45	1,390	15.05	88	95			138	17.22	7	87		
Total diseases of the ear	1,561	15.52	11	11	1,515	16.40	107	1.16			46	5.74	4	50		
Total diseases of the nose	1,107	1.07	11	11	99	1.07	8	09			8	1.00	3	37		
Total unclassified and undiagnosed	794	7.91		4	693	6.53			4	04	191	23.83				
Total for diseases	212,377	2,115.54	1,778	17.71	1,585	15.79	199,340	2,157.97	1,670	18.08	1,465	15.86	13,037	148.13	120	14.97
Drowning	7	.07		116	1.16	.08					98	1.06				
Exhaustion from exposure and fatigue	750	7.47	2	02	714	7.73	2	02			36	4.49				
Heat stroke	195	1.94	8	08	188	2.04	7	08	7	08	1	.12	1	12		
Lightning stroke	4	.04			3	.03					1	.12				
Venomous bites, stings, and wounds	855	8.52	04	1	821	8.89	3	03			34	4.24				
A broadsword, blisters, burns, and scalds	2,515	25.05	3	03	2,371	25.67					144	17.97				
Compression and concussion of brain	38	.38	3	03	37	.40	3	03	3	03	1	.12				
Contusions and sprains	7,572	75.42	4	04	6,800	73.61	4	04			772	96.32				
Dislocations	7,267	72.66	9	09	6,246	6.66	8	09			21	2.62	1	12		
Fractures (not shot)	710	7.07	44	11	678	7.34	42	45	11	12	32	3.99	2	25		
Femur	592	5.90	102	1.02	557	6.03	96	1.04			35	4.37	6	75		
Wounds, contused, lacerated, and punctured	2,352	23.43	6	06	2,082	22.54	6	06			270	33.69				
Wounds, incised	1,257	12.52	6	06	58	.58	1,182	6	06		125	15.59				
Wounds, gunshot	1,173	11.69	235	2.34	471	4.69	1,089	11.79	221	2.39	439	4.75	84	10.48	32	3.96
Secondary results of injury	4,440	4.38	58	58	405	4.38	55	55	1	01	35	4.37	3	37	1	12
Other injuries	976	9.72	11	11	849	9.19	10	11	18	19	127	15.84	1	12		
Total for injuries	19,708	196.27	491	4.89	698	6.95	17,979	194.63	463	5.01	640	6.93	1,724	215.10	28	3.49
Total for diseases and injuries	232,080	2,311.81	2,269	22.00	2,283	22.74	217,319	2,352.60	2,133	23.09	2,105	22.79	14,761	1,841.67	178	22.21

TABLE III.—*Armies, Regular and Volunteer, 1900—Admissions to sick report, discharges, and deaths from various causes, etc.—Continued.*

Year 1900.	Regular Army.				White troops, Regulars.				Colored troops, Regulars.			
	68,965				63,581				5,374			
	Admissions.	Discharges.	Deaths.		Admissions.	Discharges.	Deaths.		Admissions.	Discharges.	Deaths.	
Causes of admission to sick report.	Number.	Ratio.	Number.	Ratio.	Number.	Ratio.	Number.	Ratio.	Number.	Ratio.	Number.	Ratio.
Scarlet fever.....	5	0.07	1	0.01	5	0.08	1	0.02	7	1.30		
Measles.....	311	4.51	24	0.35	304	4.78	15	0.24	20	3.72	9	1.67
Smallpox.....	96	1.38			75	1.18			50	9.28		
Vaccinia.....	1,708	24.77			1,599	25.15			109	20.28		
Influenza.....	1,371	19.88	1	.01	1,322	20.79	1	.02	49	9.12		
Dengue.....	1,500	21.75			1,468	23.09			82	5.95		
Mumps.....	268	3.89			242	3.81			26	4.84		
Diphtheria.....	34	4.49	2	.03	32	5.00	2	.03	2	0.37		
Typhoid fever.....	531	7.70	2	0.03	506	7.96	2	0.03	25	4.65	8	1.49
Yellow fever.....	148	2.15	32	.46	148	2.33	32	.50				
Corebro spinal fever.....	5	0.07	5	.07	5	0.08						
Malarial fever, intermittent.....	27,670	401.28	14	.20	25,279	397.59	2	.03	2,391	444.92		
Malarial fever, remittent.....	6,916	100.30	14	.20	6,497	102.18	14	.22	419	77.97		
Malarial fever, pernicious.....	109	1.58	54	.78	104	1.64	52	.82	5	.93	2	.37
Malarial cachexia.....	1,390	20.01	31	.45	1,283	20.18	30	.47	97	18.05	1	0.19
Fever, undetermined.....	1,354	19.64	2	.03	1,254	19.72	2	.03	100	18.61		
Erysipelas.....	85	1.23	81	1.27	81	1.27			4	0.74		
Septicæmia and tetanus.....	21	.30	13	.19	19	.30	13	.20	2	.37		
Rheumatic fever.....	280	4.06	2	.03	259	4.07	2	.03	21	3.91	1	.19
Consumption.....	334	4.84	116	1.68	305	4.80	103	1.62	29	5.40	13	2.42
Cancer.....	12	.17	3	.04	12	.19	3	.05				
Syphilis and results.....	1,273	18.46	163	2.36	1,173	18.45	150	2.36	100	18.61	13	2.42
Gonorrhea and results.....	6,460	93.68	57	.83	5,909	92.93	54	.85	551	102.53	3	.56
Chancre and results.....	3,202	46.44	4	.06	2,897	46.56	1	.02	305	56.76	3	.56
Infections, other.....	114	1.65	8	.12	110	1.73	8	.13	4	0.74	1	.19
Total infectious diseases.....	55,186	800.32	390	5.66	50,998	800.36	357	5.61	4,298	799.78	33	6.14
Anemia.....	255	3.70	4	.06	247	3.68	3	.05	4	0.74	1	.19
Nutrition, others.....	96	1.38	53	.77	91	1.43	51	.80			2	.37
Total diseases of nutrition.....	350	5.08	57	.83	338	5.32	54	.85	12	2.23	3	.56
Alcoholism.....	1,267	18.38	12	.17	1,231	18.36	12	.19	86	6.70		
Brain and spinal cord.....	269	3.90	81	1.17	246	3.87	13	.20	23	4.29	3	.56
Insanity.....	160	2.18	110	1.60	136	2.14	102	1.60	14	2.61	8	1.49
Meningitis.....	14	.20	2	.03	13	.20	2	.03	1	.19		

Poisoning, narcotic.....	60	57	7	10	6	.09	58	91	7	11	6	.09	2	37	5	.56
Nervous system, others.....	1,980	28,28	51	74	4	.06	1,708	26,86	48	.75	4	.06	242	45,03	6
Total diseases of the nervous system.....	3,710	53,80	261	879	39	.57	3,392	53,35	247	3.88	39	.61	318	50,17	14	2.61
Poisoning, irritant.....	268	3,80	2	.03	3	.04	2,554	4,00	2	.03	3	.05	8	1,40	.....	.....
Tonsillitis, pharyngitis, and sore throat.....	2,822	40,30	18	.....	.....	.....	2,804	40,17	.....	.....	.....	.....	268	40,37	.....	.....
Pertussis.....	15	30	.....	.....	.....	.....	16	35	.....	.....	.....	.....	2	35	.....	.....
Dyspepsia, colic, and constipation.....	5,887	86,38	15	.07	2	.10	5,208	81,01	6	.08	.....	.....	679	136,35	.....	.....
Gastritis.....	2,965	29,80	17	.03	3	.03	1,950	30,07	16	.03	2	.03	115	21,40	.....	.....
Dysentery, acute.....	2,988	49,38	46	.10	98	.13	3,111	49,40	7	1.15	173	2.72	227	47,82	6	1.12	
Dysentery, chronic.....	1,569	22,61	47	.13	182	.24	1,415	22,25	46	.14	82	.24	144	36,80	9	1.67	
Diarrhœal diseases, others.....	18,866	293,54	47	.13	90	.30	17,571	276,35	47	.14	.....	.....	1,015	188,89	.....	.....
Enteritis.....	1,166	16,91	8	.13	92	.46	1,045	16,43	7	.14	26	.31	121	92,52	.....	.....
Perityphlitis and appendicitis.....	1,179	2,60	9	.12	11	.16	1,167	2,63	8	.13	9	.14	12	2,23	.....	.....
Digestive system, others.....	2,846	41,28	47	.08	27	.39	2,585	40,66	46	.72	26	.41	261	48,37	1	.19	
Total diseases of the digestive system.....	38,794	562,60	226	3.28	877	5.47	35,912	564,82	225	3.54	359	5.65	2,882	536,29	1	.19	
Heart, diseases of.....	380	5,51	75	1.09	37	.54	343	5,39	67	1.05	33	.52	37	6,80	8	1.49	
Arteries and veins.....	144	2,09	27	.39	6	.09	135	2,12	27	.42	4	.06	9	1,67	.....	.37
Total diseases of the circulatory system.....	524	7,60	102	1.48	43	.62	478	7,53	94	1.48	37	.58	46	8,56	8	1.49	
Bronchitis.....	3,472	50,36	9	.13	.....	.....	3,155	49,62	9	.14	.....	.....	317	58,90	.....	.....
Pneumonia.....	188	2,73	1	.01	16	.23	172	2,71	1	.02	15	.24	16	2,68	.....	.....
Pleurisy.....	289	4,19	15	.22	4	.06	264	4,15	14	.22	3	.05	25	4,65	1	.19	
Respiratory system, others.....	1,570	22,77	20	.29	4	.06	1,505	23,64	17	.27	4	.06	67	12,47	3	.56	
Total diseases of the respiratory system.....	5,519	80,04	45	.65	24	.35	5,094	80,12	41	.64	22	.35	425	79,08	4	.74	
Kidneys, diseases of.....	248	3,60	27	.39	30	.44	222	3,65	26	.41	28	.44	16	2,98	.....	.37
Varicoele.....	251	4,08	21	.30	.....	.....	274	4,31	21	.33	.....	.....	7	1,30	.....	.....
Genito-urinary, others.....	792	11,49	21	.30	.....	.....	725	11,40	19	.30	.....	.....	67	12,47	2	.37
Total diseases of the genito-urinary system.....	1,321	19,16	69	1.00	30	.44	1,231	19,36	66	1.04	28	.44	90	16,75	3	.56	
Adenitis.....	542	7,86	5	.07	.....	.....	488	7,68	4	.06	.....	.....	54	10,05	1	.19
Lymphatic system, others.....	63	.91	1	.01	1	.01	59	.93	1	.02	1	.02	4	.74	.....	.....
Total diseases of the lymphatic system.....	605	8,77	6	.09	1	.01	547	8,60	5	.08	1	.02	58	10,79	1	.19	
Pneumatism, muscular.....	2,869	41,61	18	.26	.....	.....	2,464	38,75	16	.25	.....	.....	405	75,37	2	.37
Ceetitis and pericetitis.....	128	1,86	7	.10	.....	.....	116	1,81	6	.09	.....	.....	13	2,42	1	.19
Arthritis and synovitis.....	684	9,92	21	.30	1	.01	608	9,56	19	.30	1	.02	76	14,14	2	.37	
Pneumatism, chronic articular.....	490	7,11	47	.68	.....	.....	431	6,78	43	.68	.....	.....	69	10,98	4	.74
Gonœitis, bones, and joints, others.....	577	5,47	38	.56	.....	.....	540	5,35	33	.52	.....	.....	37	6,89	5	.93
Total diseases of the muscles, bones, and joints.....	4,548	65,96	131	1.90	1	.01	3,958	62,25	117	1.84	1	.02	590	109,79	14	2.61	

TABLE III.—*Armies, Regular and Volunteer, 1900—Admissions to sick report, discharges, and deaths from various causes, etc.—Continued.*

Year 1900.	Volunteer Army.				White troops, Volunteers.				Colored troops, Volunteers.			
	31,434				28,793				2,641			
	Admissions.	Discharges.	Deaths.		Admissions.	Discharges.	Deaths.		Admissions.	Discharges.	Deaths.	
Causes of admission to sick report.	Number.	Ratio.	Number.	Ratio.	Number.	Ratio.	Number.	Ratio.	Number.	Ratio.	Number.	Ratio.
Scarlet fever.....	1	0.03			1	0.03			18	6.82		
Measles.....	257	8.18	5	0.16	239	8.30	5	0.17	65	24.61	32	12.12
Smallpox.....	166	5.28	90	2.86	312	10.84			16	6.06		
Vaccinia.....	328	10.43			260	9.03			1			
Influenza.....	261	8.30			1,781	61.86			40	15.15		
Dengue.....	1,821	57.98			280	9.72			21	7.95		
Mumps.....	301	9.58			11	.38			6	2.27	2	.76
Diphtheria.....	11	.35	2	.06	11	.38						
Typhoid fever.....	443	14.09	104	3.31	437	15.18	102	3.54				
Cerebro spinal fever.....	6	.19	5	.16	6	.21	5	.17				
Malarial fever, intermittent.....	28,144	895.34			27,310	948.49			834	315.79		
Malarial fever, remittent.....	4,915	156.37	11	.35	4,858	168.72	9	.31	57	21.58	2	.76
Malarial fever, pernicious.....	111	3.53	42	1.34	106	3.68	38	1.32	5	1.89	4	1.51
Malarial cachexia.....	1,682	53.51	9	.29	1,674	58.14	9	.31	8	3.03		
Fever, undetermined.....	869	27.65			834	28.97			35	13.25		
Erysipelas.....	20	.64	1	.03	20	.69	1	.03				
Septicemia and tetanus.....	11	.35	7	.22	8	.28	6	.21	3	1.14	1	.38
Rheumatic fever.....	153	4.87			140	4.86			13	4.92		
Consumption.....	160	5.09	21	.67	143	4.97	37	1.28	17	6.44	7	2.65
Cancer.....	4	.13			4	.14						
Syphilis and results.....	316	10.05	11	.35	290	10.07	10	.35	26	9.84	1	.38
Gonorrhea and results.....	1,439	45.78	1	.03	1,314	45.64	1	.03	125	47.33		
Chancre and results.....	758	24.11	1	.03	627	21.78	1	.03	131	49.60	1	.38
Infections, other.....	39	1.24	1	.03	32	1.11			7	2.65	1	.38
Total infectious diseases.....	42,216	1,343.00	45	1.43	40,788	1,416.59	43	1.49	1,428	540.70	50	18.93
Anemia.....	241	7.67			239	8.30			2	.76		
Nutrition, others.....	19	.60	3	.10	19	.66	3	.10				
Total diseases of nutrition.....	260	8.27	3	.10	258	8.96	3	.10	2	.76		
Alcoholism.....	273	8.68	1	.03	271	9.41	1	.03				
Brain and spinal cord.....	126	4.01	18	.57	111	3.86	18	.63	15	5.68	1	.38
Insanity.....	123	3.91	39	1.24	112	3.89	37	1.28	11	4.17	2	.76

TABLE III.—*Armies, Regular and Volunteer, 1900—Admissions to sick report, discharges, and deaths from various causes, etc.—Continued.*

Year 1900.	Volunteer Army.						White troops, Volunteers.						Colored troops, Volunteers.					
	31,434						28,783						2,641					
	Admissions.	Discharges.	Deaths.	Admissions.	Deaths.	Ratio.	Admissions.	Discharges.	Deaths.	Admissions.	Deaths.	Ratio.	Admissions.	Discharges.	Deaths.	Admissions.	Discharges.	Deaths.
Causes of admission to sick report.																		
	Number.	Ratio.	Number.	Ratio.	Number.	Ratio.	Number.	Ratio.	Number.	Ratio.	Number.	Ratio.	Number.	Ratio.	Number.	Ratio.	Number.	Ratio.
Meningitis.....	12	0.38	1	0.03	3	0.10	12	0.42	1	0.03	3	0.10						
Poisoning, narcotic.....	11	.45			3	.10	14	.49			3	.10						
Nervous system, others.....	689	21.92	14	.45	1	.03	680	23.14	13	.45	1	.03	109	41.27	1	0.38		
Total diseases of the nervous system.....	1,237	39.35	73	2.32	18	.57	1,100	38.20	70	2.43	16	.56	137	51.87	3	1.14	2	0.76
Poisoning, irritant.....	17	.54					13	.45					4	1.51				
Tonsillitis, pharyngitis, and sore throat.....	698	22.21					646	22.44					52	19.69				
Peritonitis.....	11	.35	2	.06	8	.25	11	.38	2	.07	8	.28						
Dyspepsia, colic, and constipation.....	2,813	89.49	5	.16			2,369	75.68	5	.17			224	84.82				
Gastritis.....	1,546	49.18					1,517	52.08					29	10.98				
Dysentery, acute.....	2,941	93.56	25	.80	136	4.33	2,805	97.42	25	.87	131	4.55	136	51.50			5	1.99
Dysentery, chronic.....	1,621	51.57	16	.51	154	4.90	1,611	55.95	16	.56	154	5.35	10	3.79				
Diarrheal diseases, others.....	18,376	590.92	13	.41	52	1.65	18,065	627.41	16	.56	52	1.81	510	183.11				
Enteritis.....	432	13.74	9	.29	9	.29	414	14.38	9	.31	9	.31	18	6.82				
Perityphilitis and appendicitis.....	80	2.55	1	.03	9	.29	73	2.64			6	.21	7	2.65				
Digestive system, others.....	1,615	51.38	7	.22	11	.35	1,543	53.59	7	.24	10	.35	72	27.28	1	.38	3	1.14
Total diseases of the digestive system.....	30,349	965.48	65	2.07	381	12.12	29,287	1,017.16	64	2.22	372	12.92	1,062	402.12	1	.38	9	3.41
Heart, diseases of.....	144	4.58	10	.32	6	.19	143	4.97	10	.35	6	.21	1	.38				
Arteries and veins.....	72	2.29	5	.16	1	.03	70	2.43	5	.17	1	.03	2	.76				
Total diseases of the circulatory system.....	216	6.87	15	.48	7	.22	213	7.40	15	.52	7	.24	3	1.14				
Bronchitis.....	1,402	44.60	3	.10			1,332	46.26	3	.10			70	26.50				
Pneumonia.....	82	2.61	1	.03	24	.76	70	2.43	1	.03	23	.80	12	4.54			1	.38
Pleurisy.....	120	3.82	5	.16	3	.10	105	3.65	5	.17	2	.07	15	6.08			1	.38
Respiratory system, others.....	555	17.66	5	.16	5	.16	526	18.27	4	.14	3	.10	29	10.98	1	.38	2	.76
Total diseases of the respiratory system.....	2,159	68.08	14	.45	32	1.02	2,033	70.61	13	.45	28	.97	126	47.71	1	.38	4	1.51
Kidneys, diseases of.....	122	3.88	5	.16	17	.54	110	3.82	5	.17	16	.56	12	4.54			1	.38

[illegible]

TABLE III.—*Armies, Regular and Volunteer, 1900—Admissions to sick report, discharges, and deaths from various causes, etc.—Continued*

Causes of admission to sick report.	United States Army.						White troops.					
	Mean strength.			29,308			26,618					
	Number.	Ratio.	Deaths.	Number.	Ratio.	Deaths.	Number.	Ratio.	Discharges.	Number.	Ratio.	Deaths.
Scarlet fever.....	62	0.20	3	0.01	52	0.20	3	0.01				
Measles.....	2,440	8.46	12	0.04	2,390	8.97	12	0.04				
Smallpox.....	39	0.13	9	0.03	35	0.13	9	0.03				
Vaccinia.....	10,882	36.96	1	0.003	9,985	37.17	1	0.004				
Indienuza.....	17,535	59.82	1	0.003	15,542	58.39	1	0.004				
Dengue.....	1,004	3.43	3	0.003	1,001	3.76	3	0.01				
Mumps.....	1,480	5.05	5	0.003	1,298	4.86	5	0.02				
Diphtheria.....	159	0.54	5	0.02	139	0.52	5	0.02				
Typhoid fever.....	5,387	18.38	21	0.07	5,228	19.62	21	0.08				
Yellow fever.....	611	2.06	73	0.25	114	0.40	73	0.27				
Cerebro spinal fever.....	44	0.15	19	0.06	42	0.15	19	0.07				
Malarial fever, intermittent.....	36,555	124.73	9	0.03	34,065	127.81	9	0.03				
Malarial fever, remittent.....	11,577	39.50	3	0.01	10,860	40.76	3	0.01				
Malarial fever, pernicious.....	2,660	9.08	82	0.28	2,508	9.41	82	0.31				
Malarial cachexia.....	4,154	14.17	4	0.01	3,817	14.32	4	0.02				
Fever, undetermined.....	15	0.05	13	0.04	3,383	11.54	13	0.05				
Erysipelas.....	15	0.05	12	0.04	14	0.05	12	0.04				
Septicemia and tetanus.....	1,451	4.95	3	0.01	1,311	4.92	3	0.01				
Rheumatic fever.....	1,779	6.06	410	1.40	1,646	6.16	410	1.52				
Consumption.....	68	0.23	8	0.03	53	0.20	8	0.03				
Cancer.....	3,762	12.84	304	1.04	3,323	12.47	304	1.13				
Syphilis and results.....	13,493	46.03	51	0.17	12,302	46.16	51	0.19				
Gonorrhea and results.....	3,646	12.56	2	0.01	3,235	12.14	2	0.01				
Chancroid and results.....	1,685	5.75	20	0.07	1,534	5.75	20	0.08				
Infections, other.....												
Total infectious diseases.....	119,099	406.37	699	2.37	1,154	3.94	109,227	409.89	740	2.78	1,027	3.85
Anemia.....	323	1.10	16	0.05	313	1.17	16	0.06				
Nutrition, other.....	299	0.99	96	0.33	293	1.00	97	0.36				
Total diseases of nutrition.....	612	2.09	111	0.38	606	2.17	113	0.42				
Alcoholism.....	8,403	28.67	9	0.03	8,274	31.06	8	0.03				
Brain and spinal cord.....	1,642	5.60	146	0.50	1,516	5.68	175	0.65				

Insanity.....	331	1.13	287	.98	8	.08	311	1.17	273	1.02	7	.08
Meningitis.....	18	.08	1	.003	10	.08	17	.06	1	.004	9	.08
Poisoning, narcotic.....	140	.48	10	.03	18	.08	134	.46	9	.08	13	.07
Nervous system, others.....	9,417	32.13	152	.52	10	.03	8,315	31.20	144	.54	9	.08
Total diseases of the nervous system.....	19,951	68.07	647	2.21	183	.62	18,565	69.67	610	2.29	174	.65
Poisoning, irritant.....	243	.83	1	.003	48	.16	233	.87	1	.004	46	.17
Tonsillitis, pharyngitis, and sore throat.....	18,423	62.38	5	.002	1	.003	16,208	60.32	5	.002	17	.06
Peritonitis.....	61	.02	20	.07	17	.06	59	.02	35	.13	2	.01
Dyspepsia, colic, and constipation.....	16,826	57.41	30	.13	2	.01	14,929	56.02	35	.13	12	.08
Gastritis.....	1,277	4.70	23	.08	13	.08	1,230	4.51	21	.08	12	.08
Diarrhœal diseases, others.....	36,023	122.08	37	.13	111	.38	33,780	120.77	33	.13	106	.40
Enteritis.....	296	3.40	6	.02	28	.09	287	3.19	6	.02	28	.09
Perityphlitis and appendicitis.....	239	8.32	6	.02	21	.07	230	8.33	6	.02	19	.07
Digestive system, others.....	8,536	29.12	59	.20	53	.20	7,622	28.61	53	.20	54	.20
Total diseases of the digestive system.....	82,730	282.28	175	.60	297	1.01	75,316	282.64	161	.60	282	1.06
Heart, diseases of.....	1,321	4.51	309	1.05	100	.34	1,220	4.48	284	1.07	92	.35
Arteries and veins.....	340	1.16	71	.24	28	.10	328	1.22	71	.27	20	.08
Total diseases of the circulatory system.....	1,661	5.67	380	1.30	128	.44	1,546	5.80	355	1.33	112	.42
Bronchitis.....	19,753	67.40	37	.13	4	.01	17,784	64.74	35	.13	4	.02
Pneumonia.....	1,051	3.49	8	.03	172	.69	899	3.37	7	.03	182	.57
Pleurisy.....	1,023	2.15	19	.06	17	.06	990	2.10	16	.05	6	.02
Respiratory system, others.....	8,522	29.06	47	.16	19	.06	7,804	28.29	45	.17	14	.05
Total diseases of the respiratory system.....	29,955	102.21	111	.38	202	.69	27,047	101.50	103	.39	176	.66
Kidneys, diseases of.....	485	1.65	52	.18	69	.24	433	1.62	47	.18	62	.23
Varicocele.....	327	1.12	35	.13	.....	.....	309	1.16	37	.14	.....	.....
Genito-urinary, others.....	1,962	6.69	72	.25	3	.01	1,696	6.86	63	.24	3	.01
Total diseases of the genito-urinary system.....	2,774	9.47	162	.56	72	.25	2,438	9.15	147	.55	65	.24
Adenitis.....	984	3.36	8	.03	.....	.....	899	3.22	8	.03	.....	.....
Lymphatic system, others.....	166	.56	5	.02	2	.01	148	.56	5	.02	2	.01
Total diseases of the lymphatic system.....	1,149	3.92	13	.04	2	.01	1,007	3.78	13	.05	2	.01
Rheumatism, muscular.....	14,180	48.38	138	.47	.....	.....	12,289	46.12	124	.47	.....	.....
Cervicitis and periorchitis.....	224	7.76	27	.09	.....	.....	200	7.70	20	.08	.....	.....
Arthritis and synovitis.....	1,046	3.65	110	.36	.....	.....	913	3.45	101	.38	.....	.....
Rheumatism, chronic articular.....	3,638	12.40	189	.64	1	.003	3,085	11.61	167	.63	1	.004
Muscles, bones, and joints, others.....	845	2.86	74	.25	2	.01	777	2.92	67	.25	1	.004
Total diseases of the muscles, bones, and joints.....	19,932	68.01	538	1.84	3	.01	17,274	64.81	479	1.80	2	.01

TABLE III. — *Army, Regular and Volunteer, 1900—Admissions to sick report, discharges, and deaths from various causes, etc.—Continued.*

Causes of admission to sick report.	United States Army.						White troops.					
	Decade, 1890-1900.			20,308			26,648					
	Admissions.	Discharges.	Deaths.	Admissions.	Discharges.	Deaths.	Admissions.	Discharges.	Deaths.	Admissions.	Discharges.	Deaths.
	Number.	Ratio.	Number.	Ratio.	Number.	Ratio.	Number.	Ratio.	Number.	Ratio.	Number.	Ratio.
Total diseases of the integumentary system.....	20,573	70.19	38	0.13	1	0.01	19,392	72.78	33	0.12	2	0.01
Total diseases of the eye.....	4,416	16.06	211	.72			3,699	13.88	192	.72		
Total diseases of the ear.....	1,911	6.52	134	.46	1	.01	1,813	6.80	130	.49	3	.01
Total diseases of the nose.....	59	1.57	28	.10	1	.03	428	1.61	26	.10	1	.004
Total unclassified and undiagnosed.....	1,761	6.01	8	.03	11	.04	1,612	6.06	8	.03	8	.03
Total for diseases.....	300,982	1,047.44	3,425	11.08	2,076	7.08	278,940	1,060.62	3,097	11.62	1,868	7.01
Browning.....	606	2.07	1	.03	150	.51					139	.52
Exhaustion from exposure and fatigue.....	706	2.41	1	.03	11	.04	682	2.18	1	.01	11	.04
Heat stroke.....	12	.04	10	.03	13	.04	677	2.64	9	.03	12	.05
Lightning stroke.....	672	1.96	2	.01	4	.01	11	.04			4	.02
Venomous bites, stings, and wounds.....	6,400	18.42	4	.01			5,655	19.01	2	.01		
Abcesses, blisters, burns, and scalds.....	190	6.01	6	.21	20	.07	161	.60	6	.22	18	.07
Compression and concussion of brain.....	34,106	116.37	62	.21	6	.02	30,822	115.67	54	.20	4	.02
Contusions and sprains.....	713	2.43	125	.43	1	.03	656	2.46	18	.07	1	.004
Dislocations.....	1,909	6.51	92	.31	42	.14	1,753	6.59	117	.44	34	.13
Fractures (not shot).....	830	2.83	299	.92	1	.03	793	2.96	217	.83	1	.004
Hernia.....	8,728	29.81	38	.13	6	.02	7,634	28.65	34	.13	6	.02
Wounds, contused, lacerated, and punctured.....	4,476	1.53	30	.07	8	.03	4,008	15.04	30	.08	6	.02
Wounds, gunshot.....	2,164	7.37	251	.79	427	1.46	1,778	6.67	216	.81	383	1.36
Secondary results of injury.....	601	2.05	62	.21	116	.40	1,621	1.90	56	.21		
Other injuries.....	7,208	24.60	67	.19			6,292	23.62	48	.18	114	.43
Total for injuries.....	98,210	282.75	909	3.10	804	2.74	91,219	229.85	881	3.12	712	2.67
Total for diseases and injuries.....	379,197	1,290.19	4,334	14.79	2,880	9.83	341,160	1,280.37	3,928	14.74	2,680	9.68

TABLE III.—*Armies, Regular and Volunteer, 1900—Admissions to sick report, discharges, and deaths from various causes, etc.—Continued.*

Decade 1889-1898.		Colored troops.				Indian troops.						
Mean strength	2,483				227							
Causes of admission to sick report.	Admissions.		Discharges.		Deaths.		Admissions.		Discharges.		Deaths.	
	Number.	Ratio.	Number.	Ratio.	Number.	Ratio.	Number.	Ratio.	Number.	Ratio.	Number.	Ratio.
Scarlet fever	82	3.37					8	3.52				
Measles	4	.16										
Smallpox	621	25.32					226	99.56				
Vaccinia	1,914	78.66			4	0.16	79	34.81				
Influenza	3	.12										
Dengue	200	8.22					42	18.50				
Mumps	20	.82										
Diphtheria	158	6.49			30	1.23	1	.44				
Typhoid fever	197	8.10			25	1.03						
Yellow fever	2	.08										
Cerebrospinal fever	424	99.62					66	29.08				
Malarial fever, intermittent	2,713	29.30			9	.37	4	1.76				
Malarial fever, remittent	19	.78			11	.45						
Malarial fever, pernicious	310	12.74					13	5.73				
Malarial cachexia	324	13.31					13	5.73				
Fever, undetermined	18	.74			4	.16	13	5.73				
Erysipelas	1	.04					4	1.76				
Septicæmia and tetanus	131	5.38	2	0.08	1	.04	9	3.96	1	0.44		
Rheumatic fever	79	3.25	39	1.60	21	.86	54	23.79	26	11.41	16	7.04
Consumption	5	.21	1	.04	2	.08						
Cancer	406	16.69	49	2.01	1	.04	83	34.54	6	2.64		
Syphilis and results	1,042	42.83	2	.08			149	65.64				
Gonorrhea and results	425	17.47					26	11.45				
Chancroid and results												
Infections, other	30	1.23	1	.04	2	.08	21	9.25	2	.88		
Total infectious diseases.	9,128	375.15	94	3.86	111	4.56	744	327.75	86	35.37	16	7.04
Anemia	10	.41	2	.08								
Nutrition, others	25	1.03	9	.37	1	.04	1	.44				
Total diseases of nutrition	35	1.44	11	.45	1	.04	1	.44				

TABLE III.—*Army, Regular and Volunteer, 1900—Admissions to sick report, discharges, and deaths from various causes, etc.—Continued.*

Causes of admission to sick report.	Colored troops.				Indian troops.			
	Decade 1890-1899.				227			
	2,433							
Mean strength								
	Admissions.		Discharges.		Admissions.		Discharges.	
	Number.	Ratio.	Number.	Ratio.	Number.	Ratio.	Number.	Ratio.
Alcoholism	198	4.19	1	0.04	10	4.41		
Brain and spinal cord	125	5.14	12	.49	3	1.32	1	0.44
Insanity	20	.82	14	.58				
Meningitis	1	.04						
Poisoning, narcotic	5	.21	1	.04				
Nervous system, others	1,031	42.37	6	.25	71	31.28	2	.88
Total diseases of the nervous system	1,301	53.47	34	1.40	85	37.45	3	1.32
Poisoning, irritant	10	.41						
Tonsillitis, pharyngitis, and sore throat	2,094	86.02			121	58.30		
Peritonitis	2	.08						
Dyspepsia, colic, and constipation	1,765	72.54	1	.16	132	58.15		
Gastritis	66	2.71	2	.08	3	1.32		
Diarrheal diseases, others	2,152	88.44	2	.08	97	42.74		
Enteritis	88	3.56			1	.44		
Perityphilitis and appendicitis	19	.78						
Digestive system, others	881	36.21	6	.25	33	14.54		
Total diseases of the digestive system	7,027	288.80	14	.58	387	170.50		
Heart, diseases of	96	3.96	23	.95	5	2.20	2	.88
Arteries and veins	14	.58						
Total diseases of the circulatory system	110	4.52	23	.95	5	2.20	2	.88
Bronchitis	1,848	75.95			121	58.30		
Pneumonia	130	5.34	2	.08	22	9.69		
Pleurisy	64	2.63	1	.04	5	2.20	2	.88
Respiratory system, others	670	27.54	1	.04	48	21.15	1	.44
Total diseases of the respiratory system	2,712	111.46	5	.21	24	9.99	3	1.32

Kidneys, diseases of	52	2.14	6	.21	7	.29			
Variocoele	18	.74	1	.04					
Gonito-urinary, others	250	10.27	8	.83			16	7.06	1 .44
Total diseases of the genito-urinary system	320	13.15	14	.58	7	.29	16	7.05	1 .44
Adentia	104	4.27					21	9.25	
Lymphatic system, others	14	.58					3	1.82	
Total diseases of the lymphatic system	118	4.85					24	10.57	
Rheumatism, muscular.	1,810	74.39	14	.58			81	35.69	
Osteitis and peritostis	25	.95	6	.25			1	.44	1 .44
Athritis and synovitis	132	5.43	9	.37			3	1.32	
Rheumatism, chronic articular	522	21.45	20	.82			18	7.93	2 .88
Muscles, bones, and joints, other	63	2.59	6	.25	1	.04	5	2.20	1 .44
Total diseases of the muscular, bones, and joints.	2,550	104.80	55	2.26	1	.04	108	47.57	4 1.76
Total diseases of the integumentary system	1,026	42.16	5	.21	2	.08	155	68.29	
Total diseases of the eye.	884	34.00	18	.71			182	58.15	1 .44
Total diseases of the ear.	86	3.29	4	.16			18	7.93	
Total diseases of the nose.	27	1.11	2	.08			4	1.76	1 .44
Total unclassified and undiagnosed	135	5.55			2	.08	14	6.17	
Total for diseases	25,153	1,033.74	279	11.47	186	7.65	1,889	832.16	49 21.57 22 9.68
Drowning	24	.99			10	.41			1 .44
Exhaustion from exposure and fatigue	26	1.19	1	.04	1	.04			
Heat stroke	1	.04							
Lightning stroke	4	1.81							
Venomous bites stings and wounds	274	11.26					3	1.32	
Abrasions blisters burns and scalds	19	.78					60	26.43	
Compression and concussion of brain	3,010	123.71	8	.33	2	.08	274	120.71	
Contusions and sprains	44	1.81	4	.16	1	.04	13	5.73	
Diseases of	131	5.38	8	.33	4	.16	25	11.01	
Fractures (not shot)	64	2.63	19	.78			3	1.32	4 1.76
Wounds contused, lacerated, and punctured	964	39.62	4	.16			140	61.67	
Wounds incised	414	17.01			3	.12	54	23.79	
Wounds gunshot	365	15.00	14	.58	53	2.18	15	6.61	11 4.84
Secondary results of injury	76	3.12	5	.21			4	1.76	1 .44
Other injuries	864	35.51	9	.37	2	.08	52	22.91	
Total for injuries	6,823	259.86	72	2.96	76	3.12	643	283.28	6 2.64 16 7.04
Total for diseases and injuries	31,476	1,293.60	351	14.43	262	10.77	2,552	1,115.42	55 24.21 38 16.72

Alcoholism.....	273	8.68	1	.03	6	.19	440	12.41	4	.11	7	.20	713	10.66	5	.07	13	.19
Brain and spinal cord.....	123	8.01	18	.57	4	.13	162	4.57	87	1.04	7	.20	288	4.31	55	.82	11	.16
Insanity.....	123	3.31	39	1.24	1	.03	10	2.70	66	1.86	2	.03	222	3.32	106	1.57	3	.04
Measles.....	12	.36	1	.03	3	.10	24	.58	.28	.03	2	.03	22	.83	1	.01	4	.06
Poisoning, narcotic.....	14	.46	1	.03	3	.10	24	.58	.28	.03	2	.03	48	.48	1	.01	5	.07
Nervous system, others.....	689	21.92	14	.45	1	.03	983	27.17	26	.73	3	.08	1,632	24.70	40	.60	4	.06
Total diseases of the nervous system.....	1,237	39.35	73	2.32	18	.57	1,708	48.18	134	3.78	22	.62	2,945	44.03	207	3.10	40	.60
Poisoning, irritant.....	17	.54	.....	.....	.....	.....	122	3.44	1	.03	1	.03	139	2.08	.....	.....	.....	.01
Tonsillitis, pharyngitis, and sore throat.....	696	22.21	.....	.....	.....	.....	629	19.18	.....	.....	3	.08	1,378	20.40	1	.01	1	.01
Peritonitis.....	11	.35	2	.06	8	.25	12	83.77	12	.34	.....	.....	23	34	.....	.....	.....	.16
Dyspepsia, colic, and constipation.....	2,813	89.49	.....	.....	.....	.....	3,012	42.77	.....	.....	.....	.....	5,082	87.30	15	.07	.....	.....
Gastritis.....	1,846	49.48	.....	.....	.....	.....	2,042	74.82	5	.14	.....	.....	3,063	43.78	12	.05	.....	.....
Dysentery, acute.....	2,941	85.56	25	.80	136	4.93	2,512	71.32	.....	.....	.....	.....	5,063	83.92	5	.07	295	3.07
Dysentery chronic.....	1,621	51.57	.....	.....	.....	.....	1,372	38.85	64	1.81	103	4.65	2,458	44.83	89	1.33	319	4.77
Diarrheal diseases, others.....	18,573	590.92	10	.31	52	1.63	13,278	374.68	34	.96	31	.87	31,853	476.26	50	.75	383	1.24
Bacterial diseases.....	482	13.14	9	.29	9	.29	960	26.80	6	.17	18	.51	1,382	20.66	14	.21	27	.40
Enteritis.....	80	2.56	1	.03	9	.29	86	2.43	6	.17	3	.08	106	2.48	.....	.....	14	.21
Perityphlitis and appendicitis.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Digestive system, others.....	1,613	51.38	7	.22	11	.35	1,663	46.32	26	.73	20	.56	3,276	49.02	33	.49	31	.46
Total diseases of the digestive system.....	30,349	965.48	65	2.07	381	12.12	25,355	715.27	156	4.40	313	8.83	55,704	882.87	221	3.30	694	10.38
Heart, diseases of.....	144	4.58	10	.32	6	.19	196	5.53	32	.90	23	.65	340	5.08	42	.63	29	.43
Arteries and veins.....	72	2.29	5	.16	1	.03	90	2.54	14	.39	2	.06	162	2.42	19	.28	3	.04
Total diseases of the circulatory system.....	216	6.87	15	.48	7	.22	286	8.07	46	1.30	25	.71	502	7.51	61	.91	32	.48
Bronchitis.....	1,402	44.60	3	.10	.....	.....	1,226	34.59	3	.08	.....	.....	2,628	39.29	6	.09	.....	.....
Pneumonia.....	82	2.61	1	.03	24	.76	73	2.12	1	.03	9	.25	137	2.35	2	.03	33	.49
Pleurisy.....	120	3.82	5	.16	3	.10	153	4.37	9	.25	7	.20	275	4.11	14	.21	5	.07
Respiratory system, others.....	535	17.66	5	.16	5	.16	494	13.94	8	.23	1	.03	1,049	15.68	13	.19	6	.09
Total diseases of the respiratory system.....	2,159	68.69	14	.45	32	1.02	1,950	55.01	21	.59	12	.34	4,109	61.44	35	.52	44	.66
Kidney, diseases of.....	122	3.88	5	.16	17	.54	131	3.70	10	.28	19	.54	253	3.78	15	.22	36	.54
Varicose.....	111	3.63	.....	.....	.....	.....	155	4.37	2	.06	.....	.....	206	3.98	2	.03	.....	.....
Genito-urinary, others.....	376	11.96	1	.03	1	.03	395	11.14	4	.11	.....	.....	771	11.53	5	.07	1	.01
Total diseases of the genito-urinary system.....	609	19.37	6	.19	16	.57	681	19.21	16	.45	19	.54	1,290	19.29	22	.33	37	.55
Adenitis.....	200	6.36	.....	.....	.....	.....	337	9.51	3	.08	.....	.....	537	8.03	3	.04	.....	.....
Lymphatic system, others.....	31	1.06	2	.06	.....	.....	35	.89	1	.03	.....	.....	69	1.03	3	.04	.....	.....
Total diseases of the lymphatic system.....	234	7.44	2	.06	.....	.....	372	10.50	4	.11	.....	.....	606	9.06	6	.09	.....	.....
Rheumatism, muscular.....	1,120	35.63	4	.13	.....	.....	1,387	39.13	10	.28	.....	.....	2,507	37.49	14	.21	.....	.....
Gout and periarthritis.....	65	2.07	1	.03	.....	.....	69	1.66	2	.06	.....	.....	124	1.85	3	.04	.....	.....
Arthritis and synovitis.....	243	7.89	5	.16	.....	.....	324	9.14	8	.23	1	.03	572	8.55	13	.19	1	.01

TABLE IV—*Armies, Regular and Volunteer, 1900—Admissions to sick report, discharges, and deaths from various causes, etc.—Continued.*

Year 1900.	Cuba.				Porto Rico.				China.			
	8,690		2,180		1,947							
	Admissions.	Discharges.	Deaths.	Admissions.	Discharges.	Deaths.	Admissions.	Discharges.	Deaths.	Admissions.	Discharges.	Deaths.
	Number.	Ratio.	Number.	Ratio.	Number.	Ratio.	Number.	Ratio.	Number.	Ratio.	Number.	Ratio.
Causes of admission to sick report.												
Scarlet fever.....	9	1.04			7	3.21			3	1.54		
Measles.....												
Smallpox.....	67	7.71			2	.92			23	11.51		
Varicella.....	60	6.90			35	16.51			63	32.36		
Dysentery.....					23	10.51			1	.08		
Mumps.....	22	2.53			3	1.38			6	3.08		
Diphtheria.....	1	.12							1	.05		
Typhoid fever.....	41	4.72			8	3.68			54	27.73		
Yellow fever.....	144	16.57			32	14.02			3	1.38		
Cerebro spinal fever.....												
Malarial fever, intermittent.....	3,863	444.53			279	127.98			1	.05		
Malarial fever, remittent.....	1,044	120.14			240	110.09			47	24.14		
Malarial fever, pernicious.....	123	14.15			1	.04			1	.06		
Malarial cachexia.....	22	2.53			18	8.26			2	1.03		
Fever undetermined.....	29	3.34			8	3.67			48	24.65		
Erysipelas.....	3	.35			2	.92			52	26.71		
Septicæmia and tetanus.....	1	.12			2	.92						
Rheumatic fever.....	18	2.07			1	.46			11	5.65		
Consumption.....	33	3.80			8	3.67			15	7.70		
Cancer.....	2	.23			10	4.59			5	2.57		
Syphilis and results.....	230	26.47			2	.92			1	.06		
Gonorrhea and results.....	972	111.85			96	44.03			18	9.34		
Chancroid and results.....	455	52.36			423	194.04			103	99.13		
Infections, other.....	4	.46			283	129.81			127	65.23		
Total infectious diseases.....	7,144	822.09			11	5.05			1	.05		
Anæmia.....	21	2.42			1,496	686.24			1,283	658.96		
Nutrition, others.....	8	.92			10	4.59			6	2.75		
Total diseases of nutrition.....	29	3.34			5	2.29			4	2.05		
Alcoholism.....	256	29.46			3	1.38			1	.05		
Grain and spinal cord.....	23	2.65			8	3.67			5	2.57		
					92	42.20			15	7.70		
					3	1.38			5	2.57		

Kidneys, diseases of.....	83	3.90	1	.12	2	.23				3	1.38					2	1.54			1	.51	
Variocoele.....	64	6.21	2	.23						18	8.26	1	.46				3	1.03				
Genito-urinary, others.....	138	16.86	1	.12												12	6.16					
Total diseases of the genito-urinary system.....	225	25.99	4	.46	2	.23				23	10.55	1	.46				17	8.73	1	.51		
Adenitis.....	54	6.21								44	20.18						7	3.60				
Lymphatic system, others.....	9	1.04								5	2.29			1	.46		2	1.03				
Total diseases of the lymphatic system.....	63	7.25								49	22.48			1	.46		9	4.62				
Rheumatism, muscular.....	300	34.62								56	25.69	1	.46				81	41.60				
Osteitis and periostitis.....	20	2.30	2	.23						5	2.29	1	.46				6	3.08				
Athritis and synovitis.....	85	9.79	2	.23						23	10.55						28	14.38				
Rheumatism, chronic articular.....	54	6.21	5	.54						5	2.29						19	4.6	1	.51		
Muscles, bones, and joints, others.....	63	7.25	2	.23						10	4.59		.46				10	6.14				
Total diseases of the muscles, bones, and joints.....	522	60.07	11	1.27						99	45.41	5	2.29				144	73.96	1	.51		
Total diseases of the integumentary system.....	1,621	186.53	3	.35						413	189.45	1	.46				338	173.59				
Total diseases of the eye.....	186	15.68	5	.58						29	13.30	1	.46				21	10.79	3	1.54		
Total diseases of the ear.....	72	8.29	4	.46						10	4.59						15	7.70	1	.51		
Total diseases of the nose.....	11	1.27								2	.92	1	.46				3	1.54				
Total unclassified and undiagnosed.....	21	2.42								1	.46						8	4.11			.51	
Total for diseases.....	13,784	1,686.19	115	13.23	73	8.40				3,047	1,397.71	30	13.76	11	5.05		5,112	2,625.58	35	17.96	46	23.62
Drowning.....	1	12			1	.12				3	1.38						97	49.82			51	
Exhaustion from exposure and fatigue.....	14	1.61															1	.51				
Heat stroke.....	6	.69															38	19.52			3	
Lightning stroke.....	101	11.62								1	.46						51	26.19			1.54	
Venomous bites, stings, and wounds.....	229	26.35			1	.12				20	9.17						43	22.04				
Abrasions, blisters, burns, and scalds.....	8	.82								20	9.17						22	11.01				
Compression and concussion of brain.....	1,249	143.72	1	.12						24	11.01						100	51.36				
Contusions and sprains.....	35	4.03	1	.12						1	.46						3	1.54				
Dislocations.....	96	11.05	5	.58	2	.23				16	7.34						18	9.24	1	.51		
Fractures (not shot).....	46	5.29	12	1.38						3	1.38	1	.46				9	4.62				
Gonorrhea.....	366	42.15								42	19.27						36	18.49				
Wounds, contused, lacerated, and punctured.....	149	17.15			1	.12				16	7.34						15	7.70				
Wounds, incised.....	29	3.34	5	.58	3	.35				12	5.60	1	.46				182	93.47	38	19.62	42	
Wounds, gunshot.....	37	4.26	3	.35	2	.23				20	9.17						12	6.16	1	.51		
Secondary results of injury.....	95	10.85	1	.12	2	.23				28	12.84	1	.46				23	11.81				
Other injuries.....	127	14.61																				
Total for injuries.....	2,493	286.88	29	3.34	12	1.38				383	180.27	3	1.38				627	322.03	40	20.54	47	
Total for diseases and injuries.....	16,277	1,973.07	144	16.57	85	9.78				3,440	1,577.96	33	15.14	11	5.06		5,799	2,947.61	75	38.62	93	

Insanity.....	246	3.09	119	1.49	3	.04	27	1.30	30	1.45	.....	.....
Measles.....	23	.29	1	.01	4	.06	3	.13	.....	.....	.....	.....
Poisoning, narcotic.....	54	.03	2	.03	6	.08	20	.97	5	.24	1	.05
Nervous system, others.....	2,005	25.16	46	.58	5	.06	634	30.64	19	.92	.....	.....
Total diseases of the nervous system.....	3,723	46.73	237	2.97	45	.56	1,224	59.16	97	4.69	12	.58
Poisoning, irritant.....	221	2.77	2	.03	1	.01	64	3.09	.....	.....	.....	.....
Tonsillitis, pharyngitis, and sore throat.....	1,733	21.74	.....	.....	13	.16	1,787	86.37	.....	.....	2	.10
Peritonitis.....	26	.33	.....	.....	.....	.....	3	.14	.....	.....	2	.10
Dyspepsia, colic, and constipation.....	6,641	83.32	6	.08	.....	.....	2,039	99.51	1	.05	.....	.....
Gastritis.....	3,375	42.35	19	.21	4	.06	236	11.41	.....	.....	.....	.....
Dysentery, acute.....	6,201	78.96	7	.09	229	2.87	78	3.77	.....	.....	.....	.....
Dysentery, chronic.....	2,118	29.15	94	1.18	83	1.04	62	3.00	17	.82	3	.14
Diarrheal diseases, others.....	35,903	442.96	57	.72	.....	.....	1,898	89.80	6	.29	1	.05
Bacteriæ.....	1,000	18.82	16	.20	29	.36	98	4.74	2	.10	.....	.....
Parityphitis and appendicitis.....	1,199	2.90	8	.10	17	.21	60	2.90	1	.05	3	.14
Digestive system, others.....	3,751	47.07	35	.44	34	.43	710	34.32	19	.92	4	.19
Total diseases of the digestive system.....	62,128	779.53	244	3.06	743	9.32	7,015	339.05	47	2.27	15	.72
Heart, diseases of.....	402	5.04	50	.63	30	.38	122	5.90	35	1.69	13	.63
Arteries and veins.....	182	2.28	20	.25	4	.06	34	1.64	12	.58	3	.14
Total diseases of the circulatory system.....	584	7.33	70	.88	34	.43	156	7.54	47	2.27	16	.77
Bronchitis.....	3,128	39.25	7	.09	.....	.....	1,746	84.39	5	.24	.....	.....
Pneumonia.....	182	2.28	2	.03	33	.41	88	4.25	.....	.....	7	.34
Pleurisy.....	317	3.98	15	.19	6	.08	52	4.45	5	.24	1	.05
Respiratory system, others.....	1,324	16.61	16	.20	7	.09	801	38.72	9	.43	2	.10
Total diseases of the respiratory system.....	4,951	62.12	40	.50	46	.58	2,727	131.80	19	.92	10	.48
Kidneys, diseases of.....	292	3.66	16	.20	39	.49	78	3.77	16	.77	8	.39
Varicocele.....	324	4.07	6	.08	.....	.....	68	3.29	15	.73	.....	.....
Genito-urinary, others.....	939	11.78	6	.08	1	.01	229	11.07	16	.77	.....	.....
Total diseases of the genito-urinary system.....	1,555	19.51	28	.35	40	.50	375	18.12	47	2.27	8	.39
Adenitis.....	642	8.06	3	.04	.....	.....	100	4.83	2	.10	.....	.....
Lymphatic system, others.....	85	1.07	3	.04	1	.01	12	.58	.....	.....	.....	.....
Total diseases of the lymphatic system.....	727	9.12	6	.08	1	.01	112	5.41	2	.10	.....	.....
Rheumatism, muscular.....	2,944	36.94	15	.19	.....	.....	1,045	50.51	7	.34	.....	.....
Osteitis and periostitis.....	156	1.94	6	.08	.....	.....	38	1.84	2	.10	.....	.....
Arthritis and synovitis.....	708	8.88	15	.19	1	.01	224	10.83	11	.53	.....	.....
Rheumatism, chronic articular.....	633	6.69	52	.65	.....	.....	143	6.91	14	.68	.....	.....
Muscles, bones, and joints, others.....	352	4.42	29	.36	.....	.....	100	4.83	21	1.01	.....	.....
Total diseases of the muscles, bones, and joints.....	4,692	58.87	117	1.47	1	.01	1,550	74.92	55	2.66	.....	.....

TABLE IV.—*Armies, Regular and Volunteer, 1900—Admissions to sick report, discharges, and deaths from various causes, etc.—Continued.*

Cause of admission to sick report.	Total Islands and China.				United States (continental).							
	79,699				20,600							
	Admissions.	Discharges.	Deaths.		Admissions.	Discharges.	Deaths.		Admissions.	Discharges.	Deaths.	
	Number.	Ratio.	Number.	Ratio.	Number.	Ratio.	Number.	Ratio.	Number.	Ratio.	Number.	Ratio.
Mean strength.....												
Year 1900.....												
Total diseases of the integumentary system.....	16,983	213.09	4	0.05	1	0.01	1,873	90.53	6	0.29		
Total diseases of the eye.....	1,220	15.31	60	.68			308	14.89	45	2.17		
Total diseases of the ear.....	1,367	17.40	82	1.03			174	8.41	29	1.40		
Total diseases of the nose.....	1,774	22.25	5	.06			33	1.59	6	.29		
Total unclassified and undiagnosed.....	719	9.02			1	.01	76	3.62			3	0.14
Total for diseases.....	186,662	2,342.09	1,105	13.86	1,446	18.63	25,715	1,242.87	673	32.62	100	4.83
Drowning.....	6	.08					1	.05			38	1.84
Exhaustion from exposure and fatigue.....	707	8.87	2	.03	78	.98	43	2.04				
Heat stroke.....	181	2.27	6	.08	9	.11	14	.68	2	.10		
Lightning stroke.....	4	.05										
Venomous bites, stings, and wounds.....	746	9.39	1	.01	1	.01	107	6.17	2	.10		
Abrasions, blisters, burns, and scalds.....	2,042	25.62	2	.03	3	.04	478	22.86	1	.05		
Compression and concussion of brain.....	4,811	60.37	2	.03	3	.04	2,761	133.43	2	.10		
Contusions and sprains.....	179	2.25	5	.06	10	.13	88	4.25	4	.19		
Dislocations.....	470	5.90	19	.24	24	.30	240	11.60	25	1.21	1	.05
Fractures (not shot).....	499	6.26	68	.85	3	.04	83	4.49	34	1.64		
Hernia.....	1,576	19.76	3	.04	3	.04	777	37.55	3	.14	2	.10
Wounds, contused, lacerated, and punctured.....	958	11.96	6	.06	56	.70	304	14.69				
Wounds, incised.....	1,116	14.00	213	2.67	460	5.77	57	2.75	22	1.05	11	.53
Wounds, gunshot.....	320	4.02	18	.23	2	.03	120	6.80	40	1.93		
Secondary results of injury.....	618	6.50	6	.06	12	.15	458	22.14	5	.24	6	.29
Other injuries.....												
Total for injuries.....	14,156	177.62	351	4.40	637	7.99	5,547	268.10	140	6.77	61	2.95
Total for diseases and injuries.....	200,818	2,519.70	1,456	18.27	2,122	26.63	31,262	1,510.97	813	39.39	161	7.78

Kidneys, diseases of.....	238	3.62	19	29	32	.49	63	4.67	5	.37	7	.52	27	2.43	3	.27	4	.36
Variocoele.....	218	3.32	7	.03			90	6.67	4	.30			58	5.21	8	.72		
Genito-urinary, others.....	788	12	11	.17			178	13.18	1	.07			142	12.76	6	.54		
Total diseases of the genito-urinary system.....	1,244	18.94	32	.49	32	.49	331	24.52	10	.74	8	.59	227	20.41	17	1.53	4	.36
Adenitis.....	491	7.47	2	.03			149	11.04					71	6.38	3	.27		
Lymphatic system, others.....	68	1.04	3	.05			15	1.11			1	.07	11	.99				
Total diseases of the lymphatic system.....	559	8.51	5	.08			164	12.15			1	.07	82	7.37	3	.27		
Rheumatism, muscular.....	2,560	38.97	17	.26			588	43.65	8	.22			571	51.33	2	.18		
Osteitis and periostitis.....	140	2.13	2	.03			30	2.22	3	.22			10	.90	3	.27		
Rheumatism, chronic articular.....	602	9.16	15	.23	1	.02	146	10.81	5	.37			122	10.97	6	.54		
Rheumatism, chronic articular.....	459	6.99	44	.67			99	7.33	10	.74			67	6.02	8	.72		
Muscles, bones, and joints, others.....	254	3.87	33	.50			105	7.78	9	.67			67	6.02	6	.54		
Total diseases of the muscles, bones, and joints.....	4,015	61.13	111	1.69	1	.02	968	71.71	30	2.22			824	74.07	25	2.25		
Total diseases of the integumentary system.....	13,644	207.71	5	.08	1	.02	2,848	210.96	1	.07			1,796	161.44	4	.36		
Total diseases of the eye.....	1,019	15.61	52	.79			221	16.37	18	1.33			175	15.73	19	1.71		
Total diseases of the ear.....	1,111	16.91	78	1.19			181	13.41	8	.59			166	14.92	16	1.44		
Total diseases of the nose.....	59	10.90	4	.06			19	1.41	5	.37			17	1.63	2	.18		
Total unclassified and undiagnosed.....	681	10.37			2	.03	64	4.00			2	.15	18	1.62				
Total for diseases.....	156,422	2,381.29	1,050	15.98	1,332	20.28	28,287	2,065.33	287	21.26	139	10.30	17,611	1,583.01	287	25.80	46	4.13
Drowning.....	2	.03			66	1.00	3	.22			16	1.19	2	.18			27	2.43
Exhaustion from exposure and fatigue.....	641	9.76	1	.02	2	.03	47	3.48					24	2.16	1	.09		
Heat stroke.....	136	2.07	5	.08	8	.12	34	2.52	2	.15	1	.07	15	1.35				
Lightning stroke.....	4	.06																
Venous bites, stings, and wounds.....	310	9.29	1	.02			112	8.30			1	.07	81	7.28	1	.09		
Abrasions, blisters, burns, and scalds.....	1,798	26.76	2	.03	3	.05	388	28.74			1	.07	259	23.28	1	.09		
Compression and concussion of brain.....	18	52.23	1	.02			2,312	171.26	3	.22	1	.07	1,429	128.45	1	.09		
Contusions and sprains.....	3,431	52.23	2	.03	3	.05	66	4.89	4	.30			47	4.22	2	.18		
Dislocations.....	140	2.13	17	.26	3	.05	176	12.96	14	1.04	3	.22	119	10.70	9	.81	4	.36
Fractures (not shot).....	353	6.37	61	.93			90	6.67	22	1.63			36	3.24	7	.63		
Hernia.....	418	6.36	3	.05	2	.03	621	46.00	1	.07			374	33.62	2	.18		
Wounds, contused, lacerated, and punctured.....	1,240	18.88	6	.09	54	.82	206	15.26	18	1.33	46	3.41	192	17.26	7	.63	9	.81
Wounds, incised.....	809	12.32	6	.09	411	6.26	131	9.70	12	.89	2	.15	85	3.15	20	1.80	1	.09
Wounds, gunshot.....	961	14.93	201	3.06			82	6.07	4	.30	3	.22	208	18.70	2	.18		
Wounds, results of injury.....	259	3.94	23	.35			299	22.15										
Secondary results of injury.....	367	5.59	4	.06	8	.12												
Other injuries.....																		
Total for injuries.....	11,167	170.00	327	4.98	557	8.48	4,574	338.82	80	5.93	75	5.56	2,907	261.31	52	4.67	43	3.87
Total for diseases and injuries.....	167,589	2,551.29	1,377	20.96	1,889	28.76	32,861	2,434.15	367	27.19	214	15.85	20,518	1,844.32	339	30.47	89	8.00

TABLE V.—*Armies, Regular and Volunteer, 1900—Admissions to sick report, discharges, and deaths from various causes, etc.—Continued.*

Mean strength	Engineers.						Ordnance						Signal Corps.					
	680						726						711					
Causes of admission to sick report.	Admissions.		Discharges.		Deaths.		Admissions.		Discharges.		Deaths.		Admissions.		Discharges.		Deaths.	
	Number.	Ratio.	Number.	Ratio.	Number.	Ratio.	Number.	Ratio.	Number.	Ratio.	Number.	Ratio.	Number.	Ratio.	Number.	Ratio.	Number.	Ratio.
Moules	1	1.47					1	1.38					1	1.41			1	1.41
Smallpox	1	1.47																
Vaccinia	15	22.06					13	17.91					6	8.01				
Influenza	1	10.29					54	74.38					19	26.72			19	26.72
Dengue	3	4.41											19	26.72			19	26.72
Mumps							1	1.38										
Diphtheria																		
Typhoid fever	3	4.41											2	2.81			2	2.81
Yellow fever							1	5.51			1	1.38						
Malarial fever, intermittent	213	357.36					45	61.98					224	329.11			1	1.41
Malarial fever, remittent	68	100					3	4.13					63	86.41			1	1.41
Malarial fever, pernicious																		
Malarial cachexia	9	13.23					2	2.75					10	14.06				
Fever, undetermined	1	5.88					1	1.38					7	9.85				
Erysipelas							3	4.13										
Rheumatic fever							3	4.13										
Conjunctivitis	1	5.88					1	1.38					8	11.35				
Syphilis and results	9	13.23					1	1.38					10	14.06			1	1.41
Gonorrhea and results	29	42.65					6	8.35					6	8.41				
Chancroid and results	19	27.94					1	1.38					19	26.72				
Total infectious diseases	415	610.29	2	2.94	1	1.47	138	190.08			1	1.38	428	601.97	3	4.22	6	8.44
Anemia																		
Nutrition, others	1	1.47					1	1.38					3	4.22				
Total diseases of nutrition	1	1.47					2	2.75					4	5.63				
Alcoholism																		
Brain and spinal cord	9	13.23					11	15.15					15	21.10				
Insanity	2	2.94					2	2.75					1	1.41				
Poisoning, narcotic	1	1.47											1	1.41				
Nervous system, others	19	27.94					22	30.80					18	25.32			1	1.41
Total diseases of the nervous system	82	47.06					35	48.21					35	49.21			1	1.41

[illegible]

TABLE V.—*Armies, Regular and Volunteer, 1900—Admissions to sick report, discharges, and deaths from various causes, etc.—Continued.*

Year 1900.	Engineers.				Ordnance.				Signal Corps.			
	680				726				711			
	Admissions.	Discharges.	Deaths.		Admissions.	Discharges.	Deaths.		Admissions.	Discharges.	Deaths.	
Causes of admission to sick report.	Number.	Ratio.	Number.	Ratio.	Number.	Ratio.	Number.	Ratio.	Number.	Ratio.	Number.	Ratio.
Drowning.....	1	1.47	1	1.47	1	1.38	1	1.38	7	9.85		
Exhaustion from exposure and fatigue.....	4	5.88	1	1.47	1	1.38			2	2.81		
Heat stroke.....	5	7.35	1	1.47	3	4.13			4	5.63		
Venomous bites, stings, and wounds.....	7	10.29							2	2.81		
Abrasions, blisters, burns, and scalds.....									1	1.41		
Compression and concussion of brain.....	49	72.06			55	75.76			17	23.91		
Contusions and sprains.....					3	4.13						
Dislocations.....					5	6.89						
Fractures (not shot).....	5	7.35			1	1.38			7	9.85	1	1.41
Hernia.....	5	7.35	2	2.94								
Wounds, contused, lacerated, and punctured.....	14	20.59			15	20.66			8	11.25		
Wounds, incised.....	10	14.70			2	2.75	1	1.38	3	4.22	3	4.22
Wounds, gunshot.....	2	2.94	1	1.47					3	4.22		
Secondary results of injury.....	7	10.29			1	1.38			1	1.41		
Other injuries.....	6	8.82			13	17.91			2	2.81	3	4.22
Total for injuries.....	115	169.12	6	7.35	101	139.12	2	2.75	57	80.17	10	14.06
Total for diseases and injuries.....	1,137	1,672.06	13	19.12	674	928.37	7	10.29	887	1,247.54	18	25.32

TABLE V.—*Armies, Regular and Volunteer, 1900—Admissions to sick report, discharges, and deaths from various causes, etc.—Continued.*

Year 1900.	Medical Corps.						Others.			
	4,288						3,676			
	Admissions.	Discharges.	Deaths.	Admissions.	Discharges.	Deaths.	Admissions.	Discharges.	Deaths.	Ratio.
Causes of admission to sick report.	Number.	Ratio.	Number.	Ratio.	Number.	Ratio.	Number.	Ratio.	Number.	Ratio.
Scarlet fever.....	1	0.23	1	0.23	44	11.97				
Measles.....	29	6.77			6	1.63				
Smallpox.....	11	2.57			388	91.96				
Vaccinia.....	29	6.77			142	38.63			1	0.27
Influenza.....	81	18.91			9	2.46				
Dengue.....	181	42.26			37	10.06				
Mumps.....	16	3.74								
Diphtheria.....	1	0.23								
Typhoid fever.....	44	10.27	3	.70	15	4.06			1	.27
Yellow fever.....	19	4.44	2	.47	10	2.72			4	1.09
Malarial fever, intermittent.....	755	176.28			387	106.28				
Malarial fever, remittent.....	394	91.99	1	.23	31	8.43				
Malarial fever, pernicious.....	5	1.17	1	.23					1	.27
Malarial cachexia.....	64	14.94			17	4.62				
Fever, undetermined.....	64	12.61			18	4.90				
Erysipelas.....	3	.70			18	4.90				
Septicæmia and tetanus.....	1	.23								
Rheumatic fever.....	16	3.74	1	.23						
Consumption.....	22	5.14			5	1.36				
Cancer.....					11	2.99			6	1.63
Gyphalls and results.....	37	8.64			1	.27				
Gonorrhea and results.....	202	47.16	3	.70	15	4.06			4	1.09
Chancroid and results.....	85	19.85			311	84.60			2	.54
Infectious, other.....	7	1.63			75	20.40				
Total infectious diseases.....	2,057	490.27	21	4.90	1,493	406.15			12	3.26
Anemia.....	10	2.33								
Nutrition, others.....	7	1.63			4	1.09				
Total diseases of nutrition.....	17	3.97	2	.47	2	.54			12	3.26
Alcoholism.....					6	1.63				
Brain and spinal cord.....	52	12.14	3	.70						
Paranitis.....	11	2.57	5	1.17	37	10.06				
Leucæmia.....	10	2.33	9	2.10	13	3.64			4	1.09
Leucæmia, other.....					3	.82			3	.82

TABLE V.—*Armies, Regular and Volunteer, 1900—Admissions to sick report, discharges, and deaths from various causes, etc.—Continued.*

Causes of admission to sick report.	Year 1900.				Medical Corps.				Others.			
	Mean strength.				4,283				3,676			
	Number.	Ratio.	Admissions.	Deaths.	Number.	Ratio.	Deaths.	Ratio.	Number.	Ratio.	Deaths.	Ratio.
Meningitis.....	12	2.80										
Poisoning, narcotic.....	121	28.25	2	0.47	1	0.23	1	0.27	2	0.54		
Nervous system, others.....				.23				19.59				
Total diseases of the nervous system.....	208	48.10	20	4.67	1	.23	1	34.28	9	2.45	2	0.54
Poisoning irritant.....	6	1.40						1.09				
Tonsillitis, pharyngitis, and sore throat.....	112	26.15			1	.23		55.50				
Peritonitis.....								294			1	.27
Dyspepsia, colic, and constipation.....	141	32.26						64.01				
Gastritis.....	182	42.92						22	5.94			
Dysentery, acute.....	182	42.92						16	4.85			
Dysentery, chronic.....	482	115.15						10	2.72	1	.27	
Diarrheal diseases, others.....	451	105.30						233	63.39	1	.27	
Enteritis.....	66	15.41	3	.70	1	.23		6	1.63			
Hepatitis.....	13	3.04						1	.27			
Hepatitis and appendicitis.....	102	23.82	1	.23	1	.23		67	18.23			
Digestive system, others.....												
Total diseases of the digestive system.....	1,286	300.26	5	1.17	14	3.27		814	221.44	2	.54	.82
Heart diseases of.....	14	3.27			2	.47		18	4.90			
Arteries and veins.....	13	3.04	3	.70	1	.23		3	.82	5	1.36	.27
Total diseases of the circulatory system.....	27	6.30	5	1.17	3	.70		21	5.71	10	2.72	.64
Bronchitis.....	106	24.75						256	69.64			
Pneumonia.....	8	1.87						14	3.81	1	.27	
Pleurisy.....	17	3.97						18	4.90			
Respiratory system, others.....	50	11.67	3	.70	1	.23		91	24.75	2	.54	
Total diseases of the respiratory system.....	181	42.26	3	.70	1	.23		379	103.10	4	1.09	.54

Kidneys, diseases of.....	18	4.20				1	.23	17	4.62	5	1.86	2	.54
Varicocele.....	13	3.04						10	2.72	7	1.90		
Genito-urinary, others.....	28	6.54	1	.23				23	6.56	3	.82		
Total diseases of the genito-urinary system.....	59	13.77	1	.23	1	.23		50	13.60	15	4.08	2	.54
Adenitis.....	15	3.50						7	1.90				
Lymphatic system, others.....	3	.70											
Total diseases of the lymphatic system.....	18	4.20						7	1.90				
Rheumatism, muscular.....	102	23.80						81	22.04				
Osteitis and periostitis.....	15	1.17						8	.82				
Athritis and synovitis.....	13	3.04						20	5.24				
Rheumatism, chronic articular.....	29	6.77	3	.70				22	5.88	1	.27		
Muscle, bones, and joints, others.....	10	2.33						10	2.72	1	.27		
Total diseases of the muscles, bones, and joints.....	159	37.12	3	.70				136	37	2	.54		
Total diseases of the integumentary system.....	232	54.17						176	47.88				
Total diseases of the eye.....	45	10.51	5	1.17				34	8.95				
Total diseases of the ear.....	46	10.74	7	1.63				18	5.17				
Total diseases of the nose.....	2	.74						3	.82				
Total diseases of the throat.....	1	.23						32	8.71				
Total unclassified and undiagnosed.....	4,336	1,012.37	72	16.81	30	7		3,296	896.63	66	17.95	18	4.90
Total for diseases.....													
Drowning.....	12	2.40			4	.93		17	4.62			1	.27
Exhaustion from exposure and fatigue.....	2	.47						1	.27				
Heat stroke.....													
Lightning stroke.....													
Venous bites, stings, and wounds.....	34	7.94						8	2.18				
Abrasions, blisters, burns, and scalds.....	21	4.90						77	20.96				
Compression and concussion of brain.....	1	.23											
Contusions and sprains.....	88	20.33						191	51.96				
Dislocations.....	4	.83											
Fractures (not shot).....	17	3.97						29	7.89	1	.27		
Fernia.....	21	4.90	4	.93				21	6.71	4	1.09		
Wounds, contused, lacerated, and punctured.....	21	4.90						59	16.06	6	1.63		
Wounds, incised.....	15	3.50						20	5.24				
Wounds, gunshot.....	15	3.50	8	1.87	1	.23		9	1.63				
Secondary results of injury.....	7	1.63	1	.23				7	1.90	2	.54		
Other injuries.....	36	8.40			2	.47		45	12.24	1	.27		
Total for injuries.....	294	68.65	13	3.04	7	1.63		488	132.75	14	3.81	2	.54
Total for diseases and injuries.....	4,630	1,081.02	86	19.85	37	8.64		3,784	1,023.88	80	21.76	20	5.44

INTERNATIONAL TABLE I.—*Examination of recruits during the year 1900.*

No.		White.	Colored.	Total.
1	Total number recruits examined	38,115	1,801	39,916
2	Of each 1,000 of these—			
3	Were accepted for service	568.68	657.97	563.16
4	Were rejected for under height	4.75	6.11	4.81
5	Were rejected for disabilities	360.80	292.06	357.70
6	Of each 1,000 accepted recruits the heights were as follows (in inches):			
7	Under 61 .....	.23	.44	.27
8	61 to 62 .....	.23	1.69	.31
9	62 to 63	1.41	3.37	1.51
10	63 to 64	11.88	15.19	12.06
11	64 to 65	96.98	84.39	96.31
12	65 to 66	135.91	125.02	125.66
13	66 to 67	169.68	184.81	170.43
14	67 to 68	185.73	186.50	185.77
15	68 to 69	155.96	145.99	155.43
16	69 to 70	111.44	114.77	111.62
17	70 to 71	70.72	64.98	70.42
18	71 to 72	34.38	33.75	34.34
19	72 to 73	15.40	18.57	15.57
20	73 to 74	7.14	9.29	7.25
21	74 upward	2.96	.84	2.86
22	Causes of rejection (exclusive of under height) expressed in ratios per 1,000 of examined recruits:			
23	Physical debility	1.10	2.22	1.15
24	Tuberculosis of lungs or other organs	3.23	2.78	3.21
25	Imperfect vision	56.57	33.67	55.79
26	Heart disease	32.66	17.77	31.99
27	Gout .....	.39		.38
28	Varicose veins, varicocele, hemorrhoids	56.43	23.88	54.99
29	Hernia	13.43	14.44	13.48
30	Flat feet	4.91	2.78	4.79

INTERNATIONAL TABLE III.—*Movements of sick by branches of military service and by month.*

VOLUNTEERS AND REGULARS, 1900.

	Absolute numbers.				Proportions per 1,000.				
	Mean strength.	Sick admissions.	Sick disposed of.		In 1,000 of mean strength there were—		In 1,000 sick disposed of there were—		
			Total. ¹	As fit for duty (recovered). ¹	By death.	Total sick admissions.	Deaths.	Fit for duty (recovered).	Deaths.
ARM OF SERVICE.									
Infantry	65,688	167,589			1,849	2,551.29	28.76		
Cavalry	13,500	32,861			214	2,434.15	15.86		
Artillery	11,125	20,518			89	1,844.32	8.00		
Ordnance	726	674			9	929.37	12.40		
Engineers	680	1,137			7	1,672.06	10.29		
Signal Corps	711	887			18	1,247.54	25.32		
Medical Department	4,283	4,630			37	1,081.02	8.64		
All others	3,676	3,784			20	1,029.38	5.44		
MONTH.									
January	99,061	21,178			196	213.79	2.00		
February	99,349	19,364			166	194.92	1.67		
March	99,411	20,756			186	208.78	1.87		
April	99,741	19,551			142	196.02	1.42		
May	99,526	20,076			170	201.72	1.71		
June	99,821	20,978			182	210.16	1.82		
July	100,907	21,881			231	216.84	2.29		
August	101,908	20,943			243	205.51	2.38		
September	101,871	17,585			247	172.61	2.42		
October	101,672	17,365			194	170.80	1.91		
November	101,184	15,876			161	156.90	1.59		
December	100,210	16,529			163	164.95	1.63		

¹ Information not tabulated.

INTERNATIONAL TABLE VI.—Admissions of important diseases by branches of military service.
VOLUNTEERS AND REGULARS, 1900.

No.	Diseases of the International nosological table.	Absolute number of admissions.								Admissions per 1,000 of mean strength.							
		Infantry.	Cavalry.	Artillery.	Ordnance.	Engineers.	Signal Corps.	Medical Department.	All others.	Infantry.	Cavalry.	Artillery.	Ordnance.	Engineers.	Signal Corps.	Medical Department.	All others.
1	Alcoholismus acutus, including delirium tremens.....	923	182	311	11	9	15	52	37	14.06	13.48	27.86	15.16	13.23	21.10	12.14	10.06
2	Bronchitis, all ¹	2,864	756	790	35	33	34	106	256	48.60	56	71.01	48.21	43.53	47.82	24.75	69.64
3	Cholera asiatica.....																
4	Cholera nostras ²																
5	Diphtheria.....	27	7	8			2	1		41	52	72			2.81	23	
6	Erysipelas.....	7,910	965	304	1	49	50	214	26	120.42	71.46	27.33	1.38	72.07	70.32	49.97	7.07
7	Febris intermitiens (malaria).....	35	8	18	3			3	18	64	59	1.62	4.13		70	70	4.90
8	Febris intermittens (malaria).....	43,831	7,739	2,795	45	243	234	760	887	667.26	573.27	251.24	61.94	357.36	329.11	177.45	105.28
9	Febris recurrens ³	11,729	1,687	846	5	77	43	458	48	178.56	124.96	76.04	6.88	113.23	60.47	106.98	13.06
10	Gonorrhoea.....	4,624	1,505	1,186	6	29	36	202	311	70.40	111.48	106.61	8.26	42.66	50.63	47.16	84.60
11	Hernia.....	4,624	1,505	1,186	6	29	36	202	311	70.40	111.48	106.61	8.26	42.66	50.63	47.16	84.60
12	Influenza.....	696	280	353	54	7	19	81	142	10.60	20.74	31.73	74.38	10.29	26.72	18.91	38.63
13	Insolatio (Hitzschlag, coup de chaleur).....	136	34	15	1	4	2	2	1	2.07	2.52	1.35	1.38	9.3	2.81	1.47	2.7
14	Meningitis cerebro spinalis epidemica.....	10								15	0.7						
15	Morbilli.....	374	33	85	1	1	1	29	44	6.69	2.44	7.64	1.38	1.47	1.41	6.77	11.97
16	Parotitis epidemica.....	399	47	67	1		2	16	37	6.07	3.48	6.02	1.38		2.81	3.74	10.06
17	Pneumonia crouposa sive lobaris.....	171	47	25	2	2	1	8	14	2.60	3.48	2.25	2.75	2.94	1.41	1.87	3.81
18	Rheumatismus articulo-rum.....	781	153	79	10	6	8	45	27	11.89	11.33	7.10	13.77	8.82	11.25	10.51	7.34
19	Scarlatina.....	4	1					1		.06	.07					.23	
20	Scorbutus.....																
21	Syphilis.....	974	333	214	1	9	6	37	15	14.83	24.67	19.24	1.38	13.23	8.44	8.64	4.08
22	Trachoma ¹																
23	Tuberculosis pulmonum.....	335	58	64		4	10	22	11	6.10	4.30	4.85		5.88	14.06	5.14	2.99
24	Tuberculosis ceterorum organorum ²																
25	Typhus abdominalis.....	680	132	82	4	3	8	44	15	10.60	9.78	7.37	6.51	4.41	11.25	10.27	4.08
26	Typhus exanthematicus ²																
27	Varicella.....	226	10	5		1	2	11	6	3.44	74	46		1.47	2.81	2.57	1.63
28	Morbi auris.....	1,111	181	166	6	19	13	46	19	16.91	13.41	14.92	8.26	27.94	18.28	10.74	5.17
29	Morbi cordis.....	349	79	46	3	13	2	14	18	6.31	5.85	4.13	4.13	19.12	2.81	3.27	4.90
30	Morbi cutis.....	13,644	2,848	1,796	44	59	67	232	176	207.71	210.96	161.44	60.61	86.77	80.17	64.17	47.88
31	Morbi mentis.....	221	23	14	1	1	1	10	3	3.86	1.70	1.26		1.47	1.41	2.33	8.82
32	Morbi oculi.....	1,019	221	175	13	15	6	45	34	15.51	16.37	15.73	17.91	22.06	8.44	10.51	9.25
33	Morbi systemat. urin. et sexual. (excl. ven. et syphilis).....																
34		1,244	331	227	3	12	4	59	50	18.94	24.52	20.41	4.13	17.64	5.63	13.77	13.60

¹ Acute not tabulated separately.

² Not tabulated separately.

³ Including malarial cachexia.

INTERNATIONAL TABLE VII.—Admissions of important diseases by months (absolute numbers).
VOLUNTEERS AND REGULARS, 1900.

No.	Diseases of the international nosological table.	Admissions by months.											
		Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1	Alcoholismus acutus, including delirium tremens.	110	114	147	129	156	114	142	115	119	182	124	138
2	Bronchitis, all ¹ .	649	500	487	397	290	237	249	350	347	439	453	566
3	Cholera asiatica.												
4	Cholera nostras ² .	11	8	3	2	7	3	2	1	2	1	3	7
5	Diphtheria et croup.	750	638	583	567	660	823	1,155	1,202	961	842	675	645
6	Dysentery.	6	3	15	10	9	9	5	10	21	8	7	2
7	Erysipelas.	5,473	5,002	5,795	5,204	4,911	4,905	4,805	4,638	3,553	3,810	3,861	4,006
8	Febris intermittens (malaria).	2,026	1,641	1,540	1,243	1,342	1,265	1,176	1,184	853	900	821	1,049
9	Febris recurrens.	553	599	699	666	669	659	693	770	628	744	678	722
10	Gonorrhea.	44	57	62	70	61	45	41	50	42	62	38	40
11	Hernia.	128	119	339	253	145	86	62	31	29	61	46	238
12	Influenza.	16	5	13	16	28	17	19	34	14	10	12	11
13	Insolatio (Hitzschlag, coup de chaleur).												
14	Meningitis cerebro spinalis epidemics.												
15	Norbili.	97	128	144	79	41	20	8	11	19	6	7	10
16	Parotitis epidemics.	192	92	46	61	35	31	26	25	17	16	20	18
17	Pneumonia crouposa sive lobaris.	36	28	22	31	16	17	17	21	11	19	21	31
18	Rheumatismus articularum.	107	82	88	102	86	86	82	92	97	115	84	89
19	Scarlatina.			2	1						1	1	1
20	Scorbutus.												
21	Syphilis.	144	136	137	123	141	133	106	131	134	120	143	141
22	Trachoma ³ .												
23	Tuberculosis pulmonum.	39	30	35	39	35	44	51	56	36	48	29	52
24	Tuberculosis ceterorum organorum ³ .												
25	Typhus abdominalis.	111	61	111	67	99	64	70	122	88	79	63	43
26	Typhus exanthematicus.												
27	Varicella.												
28	Morbi auri.	50	43	34	27	12	18	28	13	6	10	16	5
29	Morbi cordis.	100	106	126	124	155	145	134	149	126	154	121	117
30	Morbi cutis.	1,633	1,498	1,560	1,572	1,896	1,748	1,577	1,548	1,545	1,699	1,862	1,258
31	Morbi mentis.	17	16	27	28	24	19	22	19	26	40	21	14
32	Morbi oculi.	128	108	129	156	148	104	157	132	121	130	129	107
33	Morbi systemat. urin. et sexual (excl. ven. et syph.)	128	141	174	184	178	164	149	150	150	159	187	176

¹ Acute not tabulated separately.

² Not tabulated separately.

Respectfully submitted.

GEO. M. STERNBERG,
Surgeon-General, United States Army.

Hon. ELIHU ROOT, Secretary of War.

REPORT OF THE PAYMASTER-GENERAL.



ANNUAL REPORT

OF

THE PAYMASTER-GENERAL.

WAR DEPARTMENT,
PAYMASTER-GENERAL'S OFFICE,
Washington, September 25, 1901.

SIR: I have the honor to submit the following report of this office for the fiscal year ended June 30, 1901:

On July 1, 1900, officers of the Pay Department were charged with public funds aggregating.....	\$6,802,800.12
During the fiscal year these officers received:	
From the United States Treasury.....	41,862,232.71
From soldiers' deposits.....	3,438,529.11
From Army paymasters' collections.....	1,111,783.67
Total balances and receipts.....	<u>53,215,345.61</u>
Accounted for as follows:	
Expended on account of pay of the Army (regulars and volunteers)...	40,228,377.89
Expended on account of extra pay to Regular Army, war with Spain.....	88,536.66
Expended on account of extra pay to volunteers, war with Spain....	250,159.12
Expended on account of mileage to officers.....	359,836.42
Expended on account of reimbursement of traveling expenses to contract surgeons (deficiency act of March 3, 1901).....	1,470.00
Expended on account of Military Academy.....	357,727.09
Expended on account of volunteers, Treasury certificates.....	389,440.21
Surplus funds deposited to credit of United States Treasurer.....	2,686,344.97
Army paymasters' collections deposited to credit of United States Treasurer.....	1,112,909.69
Balances charged officers June 30, 1901.....	<u>7,740,543.56</u>
Total.....	53,215,345.61

A comparison of the expenditures for the fiscal year 1901, with those of the fiscal year 1900, shows an increase of \$1,301,364.61. This is accounted for by the fact that the entire volunteer force was mustered out of service at the close of the fiscal year, requiring a settlement of a large soldiers' deposit account, amounting to about \$1,000,000; also the payment of traveling expenses of discharged soldiers from point of arrival in the United States to the place of enlistment. The expenditures for the past year were for an average army of 95,583 men.

Number and amounts of deposits received from and repaid to soldiers on discharge from July 1, 1872, to June 30, 1901.

Fiscal year ending June 30—	Deposits received.		Deposits repaid.		
	Number.	Amount.	Number.	Principal.	Interest.
1873.....		\$209,450.38			
1874.....		346,609.56			
1875.....		325,255.80			
1876.....		435,912.68			
1877.....	5,524	329,585.05	14,752	\$1,041,001.57	\$49,713.49
1878.....	5,524	346,248.94	8,182	145,667.91	8,230.24
1879.....	6,087	470,770.28	4,926	257,854.48	17,705.93
1880.....	8,635	477,174.44	8,084	392,568.93	30,680.97
1881.....	8,912	524,112.72	8,148	501,949.77	38,722.62
1882.....	6,890	448,561.83	7,570	428,482.44	31,658.73
1883.....	7,902	407,544.68	6,695	363,578.34	26,124.60
1884.....	7,114	399,267.55	8,184	404,291.57	31,124.93
1885.....	7,033	427,617.96	6,930	401,902.22	28,219.44
1886.....	7,261	469,031.55	7,835	490,506.79	46,583.23
1887.....	6,899	436,574.98	6,968	399,083.12	34,758.24
1888.....	7,409	396,944.10	6,346	323,952.97	29,327.01
1889.....	7,892	383,798.34	7,664	396,468.53	33,647.38
1890.....	7,634	396,128.82	7,206	411,039.74	41,596.60
1891.....	6,790	408,473.15	9,106	553,047.47	51,737.70
1892.....	6,570	334,464.70	8,019	410,873.15	38,594.26
1893.....	6,870	282,248.04	6,317	268,835.46	26,039.07
1894.....	6,914	361,830.76	5,786	290,088.98	27,014.32
1895.....	6,284	318,270.73	5,880	308,372.45	28,766.42
1896.....	8,778	420,338.87	6,496	359,200.43	38,614.66
1897.....	17,878	535,392.64	6,976	345,559.55	34,850.58
1898.....	21,856	613,513.51	17,377	561,518.64	45,815.61
1899.....	37,842	1,496,762.31	28,508	998,774.63	61,273.95
1900.....	91,461	3,215,544.66	27,571	1,028,146.34	43,234.89
1901 ¹		3,438,529.11		4,000,000.00	100,000.00
Total.....		18,629,353.24		15,062,765.46	954,635.22
Estimated amount remaining to credit of depositors.....		3,566,587.78			

¹ Owing to the fact that the volunteer force was not mustered out of service until the last two months of the fiscal year, the accounts have not yet been fully examined and analyzed. Consequently, the total amount of deposits repaid can not be accurately stated, but it is estimated that not less than \$4,000,000 have been repaid on that account, exclusive of interest, which is also estimated to amount to about \$100,000.

NOTE.—Repayment of deposits to soldiers from July 1, 1872, to June 30, 1896, were not recorded by fiscal years. The repayments of 1877 include all deposits repaid prior thereto.

The above table gives a complete history of soldiers' deposits since the passage of the act authorizing them May 15, 1872. As will be seen by reference to the table, the number and amount of the deposits varied comparatively little from the beginning of the system until the fiscal year of 1897 and the breaking out of the Spanish war.

ENABLING ACT RECOMMENDED.

The time now seems opportune for the introduction of a bill similar in import to that which it was found necessary to pass after the civil war for the purpose of clearing the accounts of disbursing officers from suspensions and disallowances raised by the accounting officers of the Treasury for payments made in good faith, under orders of superiors or in accordance with a fair interpretation of acts of Congress, but which, months after payment and the discharge or muster-out of service of officers and men, the accounting officers decided were unwarranted in law or under military orders.

During hostilities there is no time at the disposal of officers, either within or beyond the limits of the United States, to take advantage of the permission given in the Dockery law to disbursing officers to apply to the Comptroller and await his decision precedent to payment. Common sense, recognition of precedent, an equitable construction of laws and orders, and the intent of Congress whenever it was apparent, have governed in all payments, and disbursing officers, whether of the Army or Navy, should, in justice to themselves, now have their accounts cleared up and their sureties released by an enabling act.

I submit a copy of the act of June 23, 1870, referred to in the first paragraph, and a draft of a bill drawn as nearly upon the same lines as subsequent circumstances will admit:

II. (PUBLIC—No. 100.)

AN ACT to authorize the settlement of the accounts of officers of the Army and Navy.

Be it enacted by the Senate and House of Representatives of the United States of America in Congress assembled, That the proper accounting officers of the Treasury be, and they are hereby, authorized, in the settlement of the accounts of disbursing officers of the War and Navy Departments arising since the commencement of the rebellion, and prior to the twentieth day of August, eighteen hundred and sixty-six, to allow such credits for overpayments, and for losses of funds, vouchers, and property, as they may deem just and reasonable when recommended under authority of the Secretaries of War and Navy, by the heads of the military and naval bureaus to which such accounts respectively pertain.

Sec. 2. *And be it further enacted,* That the accounts of military and naval officers, whether of the line or staff, for Government property charged to them, may be closed by the proper accounting officers whenever, in their judgment, it will be for the interest of the United States so to do: *Provided,* That such accounts originated prior to the twentieth day of August, eighteen hundred and sixty-six: *Provided,* That no settlement shall be made by the officers of the Treasury under this act which shall exceed the sum of five thousand dollars, and only of such officers of the Army and Navy and of the pay department in whose accounts there is no apparent fraud against the United States: *And provided further,* That this act shall remain in force for two years from and after its passage and no longer.

Approved, June 23, 1870.

A BILL to authorize the settlement of the accounts of officers of the Army and Navy.

Be it enacted by the Senate and House of Representatives of the United States of America in Congress assembled, That the proper accounting officers of the Treasury be, and they are hereby, directed, in the settlement of the accounts of disbursing officers of the War and Navy Departments, arising between the twenty-first day of April, eighteen hundred and ninety-eight, from which date war with Spain is declared to have existed, and the eighth day of July, nineteen hundred and one, inclusive, the date on which the last organization of the Volunteer Army was mustered out of the service of the United States, to allow such credits for payments and for losses of funds, vouchers, and property as may be recommended under authority of the Secretaries of War and Navy by the heads of the military and naval bureaus to which such accounts respectively pertain.

Sec. 2. *And be it further enacted,* That the accounts of military and naval officers, whether of the line or staff, for Government property charged to them, shall be closed by the proper accounting officers whenever, in the judgment of the Secretary of the Department to which the property pertains, it will be for the interest of the United States to do so: *Provided,* That such accounts originated subsequent to April twenty-first, eighteen hundred and ninety-eight, and prior to the ninth day of July, nineteen hundred and one: *Provided further,* That no settlement shall be made by the officers of the Treasury, under this act, which shall exceed the sum of five thousand dollars, and only of such officers of the Army and Navy in whose accounts there is no apparent fraud against the United States: *And provided further,* That this act shall remain in force for two years from and after its passage, and no longer.

One material difference between the act of June 23, 1870, and the draft is, under the latter the accounting officers are relieved of the reinvestigation of matters upon which they have passed adversely and such reinvestigation and establishment of equities are imposed upon the Secretaries of War and Navy through their bureau chiefs.

Prior to the application of new laws and where it could have been anticipated that the equitable might not have been the judicial view, this office, and individual paymasters through this office, have submitted to and received from the Comptroller more than 135 decisions

affecting the pay of the Army, between April 21, 1898, and July 31, 1901. This fact is presented to make it plain that paymasters have availed themselves of every opportunity to call upon the Comptroller when they were in doubt as to the meaning and purpose of laws, but the rapid payments required on the muster out of the two volunteer armies and the difficulty of communication between the Philippines and the United States has largely increased the number of debatable cases which the paymaster has been obliged to decide without reference to the authorities.

MILEAGE.

[Under the act of March 2, 1901.]

The new mileage law for the Army, besides being just to the Government, has been found easy of execution and is operating satisfactorily to the accounting officers, to paymasters, and to the Army at large.

The table of distances, annually prepared in this office with the greatest possible care by experts of many years' experience, is at last the legalized absolute authority in the determination of all distances and of all deductions on account of subsidized and 50-per cent railroads, and is conclusive upon the officers of this department, as well as upon the accounting officers in settlements for reimbursements for all journeys performed within and beyond the limits of the United States. Because it has been made the one guide in these matters, the demand for it in other departments and bureaus of the Government has largely increased during the current fiscal year. This table is supplemented by circulars issued periodically from this office, covering changes in the "shortest usually traveled route" between points of travel, which are constantly occurring among railroad and steamer lines in their competition for business.

This last law on mileage having fulfilled its purpose so well, no changes in it are deemed necessary.

Mileage disbursements for the fiscal year ending June 30, 1901.

	1898.	Jan. 1, 1899.	1899.	1900.	1901.	Total.
Inspection of the Army:						
By the General Commanding the Army, accompanied by his aids, and the generals commanding the several military departments, accompanied by officers of their staffs, as provided by paragraph 211, Army Regulations				\$182.96	\$5,272.92	\$5,406.88
By officers of the Adjutant-General's Department.					32.06	32.06
By officers of the Inspector-General's Department.				397.87	9,297.94	9,695.81
By officers of the Quartermaster-General's Department	\$8.24	\$35.98		190.54	9,537.48	9,772.24
By officers of the Commissary-General's Department.				1,257.45	4,913.92	6,171.37
By officers of the Medical Department				97.68	3,119.37	3,217.05
By officers of the Ordnance Department.				358.60	9,182.43	9,541.03
By officers of the Signal Corps				39.62	2,561.56	2,621.18
By officers of artillery (artillery inspection).					260.75	260.75
Inspection of—						
Troops by line officers				91.28	1,257.81	1,349.09
Horses by line officers				273.96	3,388.48	3,662.44
Transports by line officers				43.26	202.16	245.42
Buildings by line officers				11.06	305.40	316.46
Ordnance by line officers			\$6.16	6.02	311.16	323.34
Engineer and other property by line officers				2.94	458.78	461.72

Mileage disbursements for the fiscal year ending June 30, 1901—Continued.

	1898.	Jan. 1, 1899.	1899.	1900.	1901.	Total.
Inspection of—Continued.						
Colleges by line officers				\$44.33	\$511.92	\$556.25
Land, roads, bridges, and libraries by engineer officers				27.26	714.02	741.28
Inspection and instruction of the National Guard				4.76	249.42	254.18
Total for inspection of the Army	\$8.24	\$35.98	\$6.16	2,979.59	51,597.58	54,627.56
Change of station		60.81	1,326.43	12,806.24	173,792.56	187,984.84
Travel in Europe and other foreign coun- tries	16.40			1,917.23	8,494.11	10,427.74
Boards of examination to examine officers for promotion				1,042.44	16,453.42	17,495.86
Retiring boards and officers retired and ordered home				204.48	4,377.15	4,581.63
Recruiting duty		27.44		1,650.62	48,399.86	50,077.92
Travel of general officers and their aids, other than for inspection					4,267.61	4,267.61
Courts-martial and courts of inquiry, to and from				762.22	8,368.22	9,130.44
Payment of troops				221.69	6,761.50	6,983.19
Officers of the line ordered to express of- fices to obtain money for payment of troops				23.17	220.33	243.50
Boards of survey				12.95	351.35	364.30
Treasurer and professor, Military Academy (Military Academy duty)				15.12	329.56	344.68
Instructions of Secretary of War (confi- dential duty)					1,432.70	1,432.70
Target practice and inspection of target ranges				13.85	126.62	140.47
Battery competitions—provisions of G. O. 41, A. G. O., 1896					1,111.61	1,111.61
Conducting prisoners, sick and insane			1.68	29.12	269.72	300.52
Attending funerals of officers and other deceased officials					22.07	22.07
Line officers on business for Quartermaster and Commissary Departments				298.76	1,782.13	2,080.89
Boards on location of military sites				41.54	351.90	393.48
Boards on Gathman gun					92.70	92.70
Boards on buildings at Fort Hamilton					12.32	12.32
Boards on purchase land on Great Diamond Island					45.90	45.90
Boards on examination of gunners					64.24	64.24
Boards on emergency ration					632.98	632.98
Boards on range finders					12.66	12.66
Boards on electric plant					25.72	25.72
Boards on coal supply of Government steamers					13.60	13.60
Business for the War College				15.33	1,806.68	1,822.01
Census enumerator				19.78		19.78
Witnessing issue of rations to Cubans				6.30		6.30
Witnessing hanging of Filipinos					15.54	15.54
Judges of competitive drills					256.88	256.88
Washington Centennial parade					180.96	180.96
Investigating claim of Maj. W. F. Smith					118.74	118.74
Investigating damage to private property					9.38	9.38
Unveiling of Logan statue					78.96	78.96
Business of Record and Pension Office					152.60	152.60
Business for Internal Revenue Department					23.78	23.78
Observing naval maneuvers					24.60	24.60
Topographical work				32.84	32.62	65.50
Mustering duty					46.20	46.20
Special investigations					104.07	104.07
Inspection of relief work in Porto Rico				16.28	8.19	24.47
Inspection of relief work in Alaska					50.75	50.75
Inspection of relief work at Galveston, Tex.					51.94	51.94
Inspection of transport Kilpatrick					31.92	31.92
Inspection of drill grounds					79.36	79.36
Inspection of civil government in Porto Rico					38.92	38.92
Inspection of military prisons				9.76		9.76
Orders fail to state special duty enjoined	463.99		1,038.36	960.48	1,560.57	4,013.40
Total	21.64	578.22	2,372.43	23,078.87	334,061.34	360,135.50

REORGANIZATION OF THE PAY DEPARTMENT.

Under the act approved February 2, 1901, "To increase the efficiency of the permanent military establishment of the United States," 27 of the 30 majors and additional paymasters authorized by the act of March 2, 1899, were appointed to the regular establishment of the Pay Department, the increase of one each in the grade of colonel and lieutenant-colonel necessitating not more than three discharges of additional paymasters to accomplish the required legal reduction in personnel.

PERSONNEL.

Since July 1, 1900, changes in the personnel of the Pay Corps have occurred as follows:

By the act of February 2, 1901 (31 Stat., 754), the strength of the Pay Corps, in addition to the Paymaster-General, was fixed at 3 colonels, 4 lieutenant-colonels, 20 majors, and 25 captains, with provision that when vacancies occurred in the list of captains details to fill such vacancies should be made from the line of the Army.

Under said act Lieut. Col. Albert S. Towar, deputy paymaster-general, was promoted to colonel and assistant paymaster-general to fill the original vacancy created by the act, and Maj. Francis S. Dodge, paymaster, was promoted to lieutenant-colonel and deputy paymaster-general, vice Towar, promoted. Maj. Charles McClure, paymaster, was promoted to lieutenant-colonel and deputy paymaster-general to fill original vacancy created by the act, and Maj. George F. Downey and Hugh R. Belknap, additional paymasters, United States Volunteers, were appointed majors and paymasters, vice Dodge and McClure, promoted.

Col. Charles I. Wilson, assistant paymaster-general, retired from active service by operation of law on May 3, which promoted Lieut. Col. Culver C. Sniffen, deputy paymaster-general, to colonel and assistant paymaster-general, and Maj. Charles H. Whipple from paymaster to lieutenant-colonel and deputy paymaster-general. Maj. Joseph W. Wham, paymaster, was retired on May 3 on his own application. Capts. Thomas C. Goodman and James B. Houston (appointed as such from majors and additional paymasters, United States Volunteers) were promoted to majors and paymasters, vice Whipple, promoted, and Wham, retired.

Maj. Wm. Monaghan, additional paymaster, United States Volunteers, died at Manila, P. I., April 13. His commission as captain and paymaster had been issued, but was not received by him. Octavius L. Pruden accepted appointment as major and additional paymaster, United States Volunteers, May 1; accepted appointment as captain and paymaster June 6, and resigned July 1.

Maj. George G. Arthur, additional paymaster, United States Volunteers, was honorably discharged, to date April 30. Maj. Theodore Sternberg, additional paymaster, United States Volunteers, was honorably discharged May 6, having accepted appointment as captain and quartermaster, United States Army. Maj. Junius G. Sanders, additional paymaster, United States Volunteers, was honorably discharged June 20.

The following majors and additional paymasters were honorably discharged from the volunteer service and accepted appointment as captains and paymasters under the act of February 2, 1901, viz: Beecher B. Ray, Herbert M. Lord, William B. Rochester, jr., Robert S. Smith,

Seymour Howell, George T. Holloway, William G. Gambrill, Timothy D. Keleher, William B. Schofield, George E. Pickett, Otto Becker, Manly B. Curry, James W. Dawes, Joseph S. Wilkins, Eugene Coffin, James Canby, Thaddeus P. Varney, John R. Lynch, William R. Graham, Charles E. Stanton, Pierre C. Stevens, Bradner D. Slaughter.

The following captains of the line of the Army were detailed as captains and paymasters under the provisions of the act of February 2, 1901, viz: Herbert S. Whipple, United States cavalry, April 23; James W. McAndrew, United States infantry, July 6.

Maj. E. B. Robertson, Ninth Infantry, has been designated as acting paymaster of the legation guard at Peking, China, and a paymaster's clerk of the regular force was withdrawn from Manila and ordered to report to him for duty.

DISTRIBUTION OF OFFICERS.

On June 30 there were 28 officers of the Pay Department serving in the United States, including Alaska, 20 in the Philippine Islands (paying 490 posts and stations), 3 in Cuba, and 1 in Porto Rico.

CLERICAL FORCE.

The experience of the past year, and especially those months during which the volunteers were being mustered out, has again demonstrated the efficiency and value of a corps of clerks trained to administrative action on army paymasters' accounts. As rapidly as the troops arrived all rolls on which they had been previously paid, so far as received in this office, were examined and a complete statement of the result forwarded to the chief mustering officer at San Francisco, thus rendering possible the collection of many amounts which would otherwise have been lost.

Only a highly trained and zealous force could have so successfully met the demands upon them, and I earnestly recommend that when the increase in the permanent force of the office, made necessary by the increase in the Regular Army, shall be made Congress will provide for the transfer from the temporary force of the office to the permanent force of such of those clerks as may be necessary whose value has been proved by faithful and intelligent service and whose training should inure to the benefit of the Government, rather than to make new appointments with no practical experience in the important work of auditing army accounts.

I also recommend legislation establishing some system of retirement for old clerks who have served at least thirty years.

MONTHLY AND BIMONTHLY PAYMENTS.

Except in the Philippines, where payments continue to be made bimonthly, and in Alaska, where climatic conditions for more than half the year make irregular payments the rule, the Army continues to be paid monthly.

The system of payment by sending money by express is approved whenever, in the judgment of the chief paymaster and the general commanding the department, it is applicable.

In the Philippines on the 1st of June last there were, in 16 of those islands, 469 garrisoned towns, exclusive of the garrisoned city of Manila. The garrisons had increased, therefore, as compared with returns from the Philippines last winter, by about 50 posts. Consequently it is needless to say that paymasters have been fully occupied

in field duties that were at all times arduous and frequently very hazardous, as in the instances of Majors Goodman and Pickett, the former having been twice fired upon by insurgents in September, 1900, while the latter in March of this year successfully defended the public funds from an attack by a large body of insurgents, losing a noncommissioned officer of his escort.

MUSTER OUT OF 35,000 VOLUNTEERS AUTHORIZED UNDER ACT OF MARCH 2, 1899.

The volunteers authorized under section 12 of the act of March 2, 1899, were all mustered out at San Francisco between February 20 and July 8, 1901. Without exception the date of muster out was the date of payment. Eleven paymasters were stationed in San Francisco in order to expedite payments as soon as the perfected rolls left the hands of mustering officers. While the average interval between the arrival of the twenty-five regiments at San Francisco and their payment was thirteen days, from the 24th of June until the 8th of July matters were so pushed by mustering officers and paymasters that the last ten of these regiments were paid, some seven and others four days after arrival in the United States.

Many officers of these regiments, as well as a considerable portion of the men, chose to remain in the Philippines, but the date of their discharge in that country was of date with the muster out of their organizations in the States. Six hundred and ten of the returned officers could be paid travel pay only, because of want of time for them to make their returns and clear themselves of accountability or indebtedness to the Government. For valid reasons all pay was stopped against one officer, and the others were paid in full on date of muster out.

Upon the completion of the mustering out of these regiments the Secretary of War authorized the Paymaster-General to telegraph to the mustering officers and paymasters his appreciation of the very efficient manner in which the work had been completed.

The enlisted men of the Second Battalion, Porto Rico Volunteers, were discharged with final statements and reenlisted for the new organization prior to June 30, the officers being retained in service until that date. The First Battalion was mustered out and paid as a whole on June 30.

CHIEF DISBURSING OFFICE, WASHINGTON.

Attention is invited to the following summary of disbursements made during the fiscal year ending June 30 last, in the chief disbursing officer's division of this office.

Over \$4,500,000 were paid on 69,317 vouchers, an increase of 6,600 vouchers as compared with the number paid the last preceding fiscal year.

I. By Lieut. Col. G. W. Baird, chief disbursing officer:

Paid in the office	\$3, 717, 743. 66
Paid in the field.....	91, 829. 77
Total paid	\$3, 809, 573. 43
Of this there was paid for allotments.....	158, 627. 18
Paid on Treasury certificates.....	1, 095, 750. 18
Total number of vouchers, 47,587.	
Transferred to other officers.....	11, 532, 685. 15
Transferred and disbursed	<u>15, 342, 258. 58</u>

II. By Lieut. Col. Chas. McClure, July to December, 1900:

Paid in the office	\$91,008. 79	
Paid in the field.....	56, 782. 01	
Total paid		\$147, 790. 80
Of this there was paid for allotments	37, 038. 14	
Total number of vouchers, 3,176.		

III. By Maj. Webster Vinson:

Paid in the office	312, 625. 69	
Paid in the field.....	277, 921. 42	
Total paid		590, 547. 11
Of this there was paid for allotments	140, 247. 50	
Total number of vouchers, 16,343.		

IV. By Maj. H. S. Wallace, July, August, and September, 1900:

Total paid		92, 630. 40
Of this there was paid for allotments.....	30, 929. 79	
Total number of vouchers, 2,211.		

AGGREGATE.

Total paid on vouchers		4, 640, 541. 74
Allotments to enlisted men's dependents	\$366, 842. 61	
Transferred and disbursed	16, 173, 226. 89	
Total number of vouchers, 69,317.		

TRANSFERS BY CABLE.

The plan referred to in my last annual report as having been inaugurated in September, 1899, is working admirably. From the date of its adoption by this department to July 31, 1901, \$7,105,000 cash have been turned over by two banking corporations in the Philippines to the chief paymaster there for disbursement, and, with the exception of \$13,500 subsidiary coin shipped from this country in July last, it has not been necessary to ship out of this country any currency or coin to the Philippines since February 16, 1901, whereas between July 31, 1898, and the latter date, \$20,155,429.91 had been transported for the payment of the army in the Philippines.

Cash transfers since December, 1899, by the postal authorities in Cuba and Porto Rico to paymasters in those countries, amounting to a total of \$770,000, have rendered it unnecessary to transport the same amount of money from this country.

DISBURSING OFFICER'S BONDS.

Under the act approved February 2, 1901, reorganizing the Army, it is provided that after the present number of paymasters is reduced by casualties of service below the number fixed by law the Secretary of War is authorized to detail captains of the line for the performance of the duties of paymaster.

Section 1191, Revised Statutes, provides that officers of the Pay Department shall furnish a good and sufficient bond before entering upon their duties. Whatever right or justice there may have been in requiring these bonds to be furnished, it was one which they had the privilege of accepting or refusing when tendered the appointment, but with officers detailed from the line the same does not obtain. They are subject to the detail for this duty exactly as they would be for any

other duty. It may well be that their preferences, if consulted, would be to remain in command of troops, and to take them from their regular duties against their will and place them on another duty less congenial to their tastes, and in addition require them to pay from \$90 to \$180 for the privilege, seems a rank injustice.

It seems to me that the entire system of requiring bonds from officers belonging to the permanent establishment should be abolished. The officer's commission itself is a bond much more valuable than the one required. The commission of a second lieutenant even, figured in dollars and cents, would be worth more than \$30,000, while that of a captain with twenty years' service would be worth more than \$50,000. Any dereliction in the line of duty which would be covered by the surety of a bond would work the forfeiture of such commission, which it seems to me is guarantee enough for the safety of the Government. In this connection it might not be out of place to call attention to the fact that the Engineer Department disburses annually, through its officers of the different grades from that of lieutenant to colonel, millions of dollars, and none of these officers have ever been required to furnish a bond; yet, with the exception of an unfortunate case or two, the Government has never lost a penny, so that the present system makes an invidious distinction in regard to other departments whose officers are required to furnish bonds.

If it is not considered proper to accept this proposition of relying upon the commission itself for the guaranty of the honesty of the disbursing officer, I would recommend that the course which now obtains very generally among the great corporations, banks, etc., be adopted by the Government, viz, the Government itself to pay the cost of the insurance. This might be done by increasing the salary or pay of the officer required to furnish bonds, or by refunding to the officer at the end of his bond (which terminates usually in four years) the entire amount his bond has cost him, provided he has had a satisfactory settlement of his accounts and furnished the ordinary clearance from the Auditor.

Either of these courses would be a simple act of justice and remedy what is now a hardship, viz, the enforced assessment on an officer's pay for the performance of a duty without giving him any alternative in the case.

DETAILS FROM THE LINE.

There seems to be so much objection on the part of captains of the line to detail for duty in the Pay Department, that it would seem best to slightly modify the law authorizing such detail. At present the statute reads, "shall be made from the grade in which the vacancies exist," etc. (Sec. 26, act February 2, 1901.)

Officers detailed to the Pay Department are required to furnish bonds—an item of expense—and assume duties which are onerous and sometimes distasteful. At any rate, it is difficult to find officers of the rank of captain who are willing to accept a detail in the Pay Department.

I would therefore recommend that the paragraph above referred to be amended to read as follows:

Details for the position of captain and paymaster shall be made from the first lieutenants of the line of the Army and they shall have, while continued on such duty, the rank, pay, and allowances of a captain mounted.

INCREASED PAY FOR HIGHER COMMAND.

It is believed that some further legislation should be enacted in order that the law giving increased pay for higher command in time of war may work more smoothly and justly. Under the various decisions of the Comptroller the situation is now anomalous. Two officers performing identical service in commands above those appropriate to their grades are yet treated differently in the matter of payment. If the commanding officer of one gave him an order for the duty and such order was approved by either the Secretary of War or the commanding general of the Division of the Philippines, he received the pay appropriate to the higher command; whereas the other, who succeeded by seniority and performed duties which he could not avoid performing without subjecting himself to discipline, received no higher pay. The restrictions enforced by the various decisions named seem technical and more appropriate to a quiet office desk than to the actual business of warfare, where, as a matter of duty, custom, and regulation, every officer steps into the exercise of the higher duty the instant the necessity arises without waiting for the action of a general hundreds of miles, or a chief of a department many thousands of miles, distant. It is therefore recommended that the following be enacted:

Be it enacted, etc., That hereafter all officers who, in time of war and serving with troops operating against an enemy, shall, by seniority, succeed to and exercise commands above those pertaining to their grades, for a continuous period of not less than thirty days, shall be considered as exercising such commands by competent authority, and shall be held to be entitled to receive the pay and allowances of the grade appropriate to the command so exercised, under the conditions and restrictions set forth in section seven of the act of Congress approved April twenty-sixth, eighteen hundred and ninety-eight, "For the better organization of the line of the Army:" *Provided,* That all officers who, since the twenty-sixth day of April, eighteen hundred and ninety-eight, have exercised higher command than that appropriate to their grade, under the conditions of said act and of act of May twenty-sixth, nineteen hundred, requiring service of three months continuously, shall be held to be entitled to the pay and allowances herein provided for.

RETIREMENTS.

I would recommend that section 1274, Revised Statutes, shall be amended to read—

Hereafter officers retired from active service shall receive seventy-five per centum of the pay of the rank upon which they were retired: *Provided,* They are retired on account of incapacity and that their incapacity is an incident of service, or if retired on account of age they shall have had at least thirty years of service as officers or enlisted men. Officers retired on account of age who have had less than thirty years of service as officers or enlisted men shall receive a proportionate amount of seventy-five per centum of the maximum pay of the rank on which they are retired; for instance, for ten years' service they shall receive one-third of seventy-five per centum of the maximum pay of the grade; for twenty years' service, two-thirds of seventy-five per centum of the maximum pay of the grade.

Attention is invited to the exhibits which are appended, showing in detail the accounts with the several appropriations and the receipts and expenditures of the individual officers of the Pay Department.

Very respectfully,

A. E. BATES,
Paymaster-General, United States Army.

THE SECRETARY OF WAR.

Statement showing the number of pay trips made, number of days consumed in travel, posts paid, and amount of field and office disbursements made by each disbursing officer of the Pay Department, United States Army, during the fiscal year ending June 30, 1901.

Rank and name.	Number of pay trips.	Days consumed.	Number of posts paid.	Ambulance.	Stage.	Miles traveled.			Total.	Payments.		Total.
						Railroad.	Steamer.	Other conveyance.		In field.	In office.	
<i>Assistant paymasters-general.</i>												
Coxe, F. M.	6	15	14	36			797	45	878		\$754,913.82	\$754,913.82
Wilson, C. I.	22	29	68	64		140	1,344		1,548		815,476.25	815,476.25
Tovar, A. S.	3	9	19	20		457	457		954		174,985.74	174,985.74
Sniffen, C. C.	12	27	40				6,438	102	6,540			
<i>Deputy paymasters-general.</i>												
Baird, G. W.										891,829.77	3,720,743.66	3,812,573.43
Dodge, F. S.									1,548	411,903.79	565,021.09	565,021.09
McClure, Chas.									954	66,782.01	91,038.79	147,730.80
Whipple, C. H.										703,281.61	703,281.61	982,826.27
<i>Paymasters.</i>												
Comstock, W. H.	3	7	17	50			194		244	78,099.98	988,795.52	1,046,895.45
Tucker, W. F.	3	50	43				3,492	16	3,496	94,165.13	122,402.11	216,567.24
Muhlenberg, J. C.	12	82	46			2,692	1,692	36	4,410	315,255.55	651,041.26	966,276.81
Smith, G. R.	49	74	171	12		6,544	1,498		7,084	338,721.09	1,068,245.60	1,406,966.69
Baker, J. P.	12	7	82	3		251			254	40,246.15	494,082.99	534,309.14
Stallford, E. W.	7	36	27	28		4,038	466	40	4,572	91,206.85	494,096.46	585,303.31
Kilbourne, C. E.	52	52	73	344		1,382	80	55	617	1,020,230.17	451,876.67	1,472,106.84
Bullis, J. L.	4	9	116	52		1,962	459	24	2,088	330,372.16	376,609.83	706,982.13
Rogers, H. L.	12	83	48	1,020		742	4,073	106	2,453	567,762.26	82,617.19	650,379.45
Watrous, J. A.	15	112	62	499					4,667	443,193.01	110,000.00	553,193.01
Gilbert, W. W.	23	117	113			423	3,334	569	4,601	899,346.99	151,345.70	1,050,692.50
Rees, H. L.	23	128	89	48		2,447	2,723	238	5,466	777,921.42	312,625.69	1,090,547.11
Vinson, W.	12	53	82	90		210			306	798,408.97	106,773.21	905,182.18
Newbold, Chas.	15	16	82							609,654.08	40,621.01	650,275.09
Wallace, H. S.	19	185	80	1,080		2,787	10,295	21	14,064	732,128.94	36,694.09	768,823.03
Payson, F. L.	20	187	106	710			4,986		5,646	86,772.70		95,466.70
Downey, G. F.	2	7	10							985,135.56	80,691.61	1,064,727.17
Belknap, H. R.	27	27	37	216		194		60	460	885,694.06	61,577.50	947,271.56
Goodman, T. C.	18	126	120	146			3,418	692	4,245	273,451.53	603,942.67	877,394.20
Houston, J. B.	32	37	126			3,126			3,128	658,400.41	136,922.45	795,322.86
Ray, B. B.	19	84	22	40		3,630	1,360	182	5,172	116,366.35	242,916.74	359,283.09
Lord, H. M.	33	33	67	40		3,096			4,617	922,088.69	219,664.96	1,141,753.65
Rochester, W. B., Jr.	10	116	126	693		8,896	4,505	163	6,567	816,702.69	111,162.84	927,865.53
Smith, R. S.	9	176	161	111		156	8,991	616	9,876	480,723.95	107,545.43	588,269.37
Holloway, G. T.	8	108	128	122		508	906	941	3,512			4,420,944.94

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<i>Additional paymasters.</i>									
Gambrell, W. G.	18	65	20	500	144	60	708	1, 142, 839.36	55, 909.35
Kelcher, T. D.	18	52	25	433	198	89	715	578, 883.20	155, 837.67
Schofield, W. B.	10	79	37	306	481	6, 614	7, 711	846, 184.95	202, 866.79
Pickett, E.	8	139	160	385	981	141	1, 147	846, 184.95	61, 130.43
Becker, O.	28	70	90	407	8, 688	2, 541	3, 700	819, 904.15	157, 748.49
Curry, M. R.	22	120	56	407	1, 388	2, 541	3, 700	819, 904.15	897, 733.11
Davies, J. W.	28	82	53	132	1, 122	302	1, 009	849, 383.57	178, 339.74
Wilkins, J. S.	15	146	62	122	1, 122	302	1, 009	849, 383.57	158, 371.79
Coffin, Eugene	15	164	182	631	6, 866	302	1, 071	286, 401.94	254, 897.08
Conby, James	116	116	79	944	9, 780	2, 541	7, 844	790, 466.66	150, 321.12
Vanoy, J. P.	13	136	97	162	1, 388	2, 541	3, 700	819, 904.15	897, 733.11
Lynch, J. R.	13	136	97	162	1, 388	2, 541	3, 700	819, 904.15	897, 733.11
Stanton, C. E.	13	136	97	162	1, 388	2, 541	3, 700	819, 904.15	897, 733.11
Stevens, P.	14	158	121	619	5, 883	1, 267	9, 237	888, 132.47	375, 680.16
Stoughton, B. D.	12	88	118	482	1, 437	1, 267	7, 622	220, 422.45	308, 291.86
Whipple, H. S.	16	22	62	27	1, 762	1, 267	1, 494	60, 762.01	458, 714.31
	1	8	11				1, 762	6, 623.46	51, 063.46
<i>Acting paymasters.</i>									
Howell, S.	5	20	33	135	210	460	813	341, 843.54	598, 115.71
Graham, W. R.	5	122	104	338	477	4, 205	5, 114	524, 822.68	44, 596.88
Wongach, Wm.	5	122	104	338	477	4, 205	5, 114	524, 822.68	44, 596.88
Sternberg, Theo.	18	106	100	593	299	1, 762	2, 863	473, 321.98	54, 140.22
Sanders, J. G.	12	81	126	224	3, 978	4, 388	4, 282	668, 713.42	414, 869.89
Arthur, G. G.	10	110	97					626, 140.70	420, 800.40
<i>Acting paymasters.</i>									
Ray, P. H. ¹	2	2	4					38, 432.51	38, 432.51
Roberson, E. B.								10, 888.36	10, 888.36
Total	737	3, 683	3, 978	12, 495	54, 841	109, 688	8, 247	23, 850, 869.74	18, 324, 687.65
									41, 675, 547.39

¹ On special duty in Paymaster-General's Office.

² No detailed statement received from these officers.

REPORT OF THE SECRETARY OF WAR.

Statement showing the balance in the hands of each disbursing officer of the Pay Department, United States Army, on the 1st of July, 1900; the amount remitted to each from the United States Treasury, or turned over by other agents during the fiscal year ending June 30, 1901; the amounts accounted for by accounts and vouchers of expenditures, or by transfer or replacement in the Treasury, and the balance remaining in the hands of paymasters to be accounted for in the next fiscal year.

Rank and name.	Balance in hands of each paymaster on June 30, 1900.	Remitted from the Treasury in the year ending June 30, 1901.	Received from other paymasters.	Received from soldiers' deposits.	Received from paymaster's collections.	Total received and to be accounted for.	Surplus deposited in the Treasury.	Paymaster's collections deposited in the Treasury.	Expenditures.	Transferred to other paymasters.	Balance in hands of each paymaster on June 30, 1901.	Total accounted for.
<i>Colonels and assistant paymasters-general.</i>												
Coxe, F. N.	\$92,931.97	\$18,561,750.00	\$420,848.28	\$8,687.50	\$4,283.28	\$19,088,500.96	\$45,013.24	\$4,283.28	\$754,913.82	\$16,583,546.43	\$1,680,744.26	\$19,088,500.96
Wilson, C. I.	28,249.44	2,923,310.45	172,739.51	10,738.00	3,054.25	3,136,151.65	57,000.00	3,054.25	815,478.25	2,320,673.40	3,136,151.65	3,136,151.65
Towar, A. S.	1,004,883.29	600,000.00	16,368,983.03	1,020.00	2,254.74	16,977,151.06	1,071,471.67	2,254.74	174,985.74	14,212,228.74	1,516,300.17	16,977,151.06
Sniffin, C. C.												
<i>Lieutenant-colonels and deputy paymasters-general.</i>												
Baird, G. W.	1,377,349.75	15,401,172.26	197,082.50	25,489.28	20,069.10	17,021,182.86	712,734.46	20,069.10	3,812,573.43	11,582,685.15	943,100.75	17,021,182.86
Dodge, F. S.	83,609.27	830,000.00	782,672.55	29,498.35	16,897.62	1,742,077.79	148,688.56	16,897.62	535,021.09	496,071.38	123,999.14	1,742,077.79
McClure, Chas.			601,177.69	2,253.50	2,339.78	605,750.97		2,339.78	147,790.80	455,620.39		605,750.97
Whipple, C. H.	54,085.46	867,000.00	533,501.09	16,720.04	12,114.76	1,483,401.35	26,642.08	12,114.76	862,826.27	472,175.71	109,641.90	1,483,401.35
<i>Majors and paymasters.</i>												
Comegys, W. H.	81,509.37		1,557,734.92	26,898.59	7,920.76	1,674,053.94		7,920.76	1,046,835.45	292,305.69	326,992.04	1,674,053.94
Tucker, W. F.	164,589.26		602,277.09	39,739.40	5,890.28	712,496.03		5,890.28	216,567.24	188,629.36	318,940.94	712,496.03
Muhlenberg, J. C.	71,305.81	46,000.00	1,118,095.65	23,129.16	25,894.99	1,284,425.61	7,145.25	25,894.99	966,276.81	242,172.67	91,479.20	1,284,425.61
Smith, G. R.	65,472.96	354,000.00	1,353,730.91	29,440.33	21,861.48	1,824,505.69	1,817.82	21,861.48	1,406,944.09	189,167.13	151,697.62	1,824,505.69
Baker, J. P.	77,076.75	394,000.00	237,130.96	15,336.28	14,717.88	736,251.32	40,068.97	14,717.88	534,309.14	1,595,998.17	169,978.76	736,251.32
Hallford, E. W.	58,474.62		2,224,406.81	31,280.70	10,565.62	2,319,699.55		10,565.62	665,943.31	7,000.00	48,041.06	2,319,699.55
Kilbourne, C. E.	41,491.16		1,457,603.65	28,053.09	20,472.33	1,547,630.23		20,472.33	1,472,106.84	16,602.22	12,513.23	1,547,630.23
Bulla, J. L.	18,914.09		423,129.16	18,914.62	16,562.63	569,099.45	2,000.59	16,562.63	899,842.13	32,036.17	959,049.45	569,099.45
Rogers, H. L.	282,657.65		633,923.77	21,605.70	20,902.33	999,099.45	251,623.26	20,902.33	626,243.35	128,394.34	382,036.17	999,099.45
Watrous, J. A.	57,898.06		764,969.72	99,817.29	29,037.19	964,745.50		29,037.19	620,370.06	173,129.71	251,696.83	964,745.50
Gilbert, W.	72,432.17		1,066,278.36	160,177.44	45,157.87	1,344,040.84	603.10	45,157.87	1,050,692.59	33,966.09	213,621.19	1,344,040.84
Rees, H. L.	47,293.06		581,076.95	19,025.12	14,553.91	662,542.06		14,553.91	580,547.11	563.63	58,477.41	662,542.06
Vinson, Webster	49,874.37	119,000.00	940,533.01	5,911.79	11,610.04	1,126,929.20	16,500.00	11,610.04	905,162.14	109,230.70	84,416.28	1,126,929.20
Newbold, Chas.	56,737.09		1,917,406.31	97,200.50	26,176.59	2,096,611.49	2.00	26,176.59	690,075.04	1,383,540.50	177,468.38	2,096,611.49
Wallace, H. S.	36,983.51		703,705.82	157,372.75	34,922.93	991,895.01		34,922.93	738,897.03	111,711.02	70,414.08	991,895.01
Payson, F. L.	55,447.26		93,983.21	13,805.00	2,641.54	165,738.01		2,641.54	88,772.70	76,413.77		165,738.01

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Belnap, H. R.	82, 974.47	1, 121, 018.86	15, 878.81	22, 933.83	1, 084, 727.17	47, 852.41	37, 182.66	1, 192, 805.87
Goodman, T. C.	640, 000.00	1, 083, 189.01	186, 882.27	34, 675.02	997, 171.56	804, 727.81	86, 072.41	1, 834, 646.30
Houston, J. B.	39, 422.38	499, 500.00	38, 256.20	13, 919.64	777, 394.20	33, 005.16	59, 570.02	910, 086.17
<i>Captain and paymasters.</i>								
Ray, B. B.	41, 802.52	852, 431.13	14, 474.43	15, 288.33	745, 523.09	104, 477.08	47, 472.91	923, 998.41
Lord, H. M.	134, 662.26	308, 579.14	19, 822.72	12, 141.94	359, 292.09	274, 140.81	28, 822.78	674, 936.46
Rochester, W. B., Jr.	53, 678.97	1, 090, 731.91	97, 969.01	37, 000.80	1, 541, 633.56	66, 349.26	62, 563.08	1, 279, 571.69
Smith, R. S.	44, 232.46	1, 696, 857.44	173, 160.20	28, 539.01	1, 621, 894.94	1, 062, 919.47	181, 460.00	2, 142, 112.12
Holloway, G. T.	282, 463.36	1, 628, 838.71	79, 822.02	20, 083.65	1, 928, 789.28	1, 805, 579.65	68, 94	1, 928, 789.28
Hambrill, W. G.	54, 023.38	1, 274, 680.60	11, 563.08	16, 163.24	1, 384, 885.13	344, 458.97	25, 188.57	1, 454, 885.16
Kelner, T. D.	46, 108.09	1, 061, 009.64	12, 737.26	18, 739.41	1, 107, 486.20	27, 418.17	27, 418.17	1, 107, 486.20
Shofield, J. B.	40, 880.87	913, 070.11	119, 895.68	35, 947.64	1, 122, 036.66	230, 144.22	57, 494.16	1, 122, 036.66
Pickett, G. E.	46, 108.09	819, 662.60	162, 127.47	38, 065.79	799, 800.19	110, 967.97	43, 099.47	1, 062, 373.95
Becker, C. O.	110, 748.31	308, 001.01	182, 143.66	23, 317.48	907, 412.65	66, 858.59	62, 917.45	1, 200, 186.28
Curry, J. W.	9, 740.00	866, 220.92	182, 143.66	41, 033.39	937, 735.11	182, 091.08	85, 602.47	1, 701, 697.60
Davies, J. S.	186, 824.77	572, 179.51	26, 145.66	23, 029.47	410, 474.08	1, 410, 698.04	73, 106.52	2, 021, 316.86
Wilkins, J. S.	27, 946.75	1, 771, 396.06	60, 657.81	12, 435.21	1, 069, 669.74	72, 720.87	66, 106.45	1, 069, 669.74
Conlin, Eugene	44, 866.61	611, 817.49	190, 804.29	39, 573.14	940, 767.78	121, 996.28	91, 804.74	1, 224, 647.40
Canby, James	21, 867.81	1, 028, 368.12	120, 804.29	30, 608.88	960, 238.00	1, 067, 507.19	64, 200.51	2, 250, 783.57
Varney, J. P.	43, 720.00	2, 098, 275.16	113, 782.40	26, 638.30	962, 837.67	88, 803.24	45, 021.88	1, 607, 476.92
Lynch, J. B.	240, 428.95	306, 106.71	82, 242.88	20, 465.30	440, 024.72	228, 709.75	70, 000.00	1, 831, 717.72
Stanton, C. E.	46, 563.62	915, 064.27	188, 277.26	84, 867.25	1, 043, 060.72	98, 198.97	58, 028.89	1, 608, 972.78
Stevens, F. C.	29, 739.02	437, 805.62	30, 073.13	16, 090.61	486, 714.31	69, 928.19	55, 262.21	646, 179.48
Slaughter, B. D.		219, 167.13	16, 065.94	10, 177.39	419, 811.69		17, 461.14	75, 782.62
Whipple, H. S.		37, 760.88	2, 287.17	734.47	57, 866.91			
<i>Majors and additional paymasters.</i>								
Howell, Seymour	47, 605.69	3, 205, 438.20	83, 120.20	23, 870.49	939, 969.26	2, 396, 205.04		3, 380, 034.78
Monaghan, William	46, 763.14	624, 790.71	82, 672.19	19, 365.90	827, 467.10	70, 430.02	24, 188.92	673, 651.94
Sternberg, Theo.	233, 194.32	905, 196.78	161, 399.86	41, 848.94	1, 084, 038.31	200, 804.63		1, 329, 098.96
Sanders, G.	47, 651.78	257, 600.00	89, 427.87	17, 203.81	632, 963.78	12, 760.88		1, 604, 688.46
Graham, W. R.	67, 857.68	1, 116, 240.00	93, 410.16	25, 677.41	968, 969.61	706, 228.22		1, 802, 866.24
Arthur, G. G.	40, 208.08	502, 720.00	95, 425.43	23, 758.11	580, 464.70	24, 076.71	386.70	662, 106.57
<i>Acting paymasters.</i>								
Ray, P. H. ¹	70, 822.50	8, 513.12	8, 512.55	1, 901.96	33, 432.51	52, 789.64		89, 250.12
Robertson, E. B.		58, 118.69	610.00	451.67	10, 868.36		44, 840.23	56, 180.26
Total	6, 802, 800.12	41, 862, 232.71	62, 718, 690.51	1, 111, 783.67	115, 964, 036.12	2, 686, 344.97	62, 718, 690.51	7, 740, 543.56
								115, 964, 036.12

¹ On special duty.

² Captain, United States Cavalry.

³ \$1,126.02 received as paymaster's collections from August 1, 1899, to June 30, 1900, by Maj. P. H. Ray, acting paymaster, United States Army, at Fort Egbert, Alaska, having been deposited to credit of Treasurer of the United States during the fiscal year ending June 30, 1901, accounts for the excess of credit over debit collections to that amount. See note 3, page 16, annual report of Paymaster-General, United States Army, for 1900.

Statement of the account of the Pay Department, United States Army, with the

Appropriations.	In account with the Treasury.					Total.
	Balance in the Treasury, July 1, 1900.	Amount of appropriations and transfer warrants.	Unexpended balances deposited.	Paymasters' collections deposited.	Repayments in settlement of accounts.	
Pay, etc., of the Army, 1901.....		\$46,463,176.23	\$277,291.87	\$414,566.41	\$451.44	\$47,156,505.96
Pay of Military Academy, 1901.....		387,362.43		82.61		387,445.04
Mileage to officers traveling without troops, 1901.....		700,000.00		843.76		700,843.76
Pay, etc., of the Army, 1900.....	\$4,683,071.08	30,756.41	1,648,369.57	253,765.57	1,134.39	10,617,126.97
Pay of Military Academy, 1900.....	30,211.67		962.50	666.85		31,840.92
Mileage to officers traveling without troops, 1900.....	277,144.72	477.80	72,606.74	3,082.04		358,290.30
Pay, etc., of the Army, 1899.....	862,534.01	286,756.05	340,723.41	9,008.78	1,174.46	1,500,191.71
Pay of Military Academy, 1899.....	32,573.67	58.33		600.99		33,232.99
Mileage to officers traveling without troops, 1899.....	26,841.83		52,802.47	5,797.26	55.80	85,497.36
Pay, etc., of the Army, Jan. 1, 1899.....	1,301,789.01	195,701.65	56,789.36	2,833.90	489.50	1,557,608.22
Mileage to officers traveling without troops, Jan. 1, 1899.....	11,796.42	3,458.20	6,718.26	732.82		22,705.70
Pay, etc., of the Army, 1898 and prior years.....			9,883.05	1,458.43	1,959.03	13,295.51
Pay of Military Academy, 1898 and prior years.....				73.28		73.28
Mileage to officers traveling without troops, 1898 and prior years.....			35.40	888.12		923.52
Reimbursement to contract surgeons.....		10,000.00				10,000.00
Pay of two and three year volunteers, 1871 and prior years.....					271.43	271.43
Extra pay to volunteers, war with Spain.....		256,328.58	121,009.04	433.86	102.56	377,874.04
Extra pay to Regular Army, war with Spain.....		3,189.60	68,072.30	117.20	76.29	71,405.39
Bounty under act of July 28, 1866, indefinite.....					485.00	485.00
Bounty to Fifteenth and Sixteenth Missouri Cavalry Volunteers.....		1,000.00				1,000.00
Extra pay to officers and men who served in Mexican war.....		1,212.00				1,212.00
Three months' pay proper.....						
CERTIFIED CLAIMS.						
Pay, etc., of the Army.....	1,526.16	8,619.55		10.75		10,156.46
Arrears of pay, bounty, etc., 1901.....		406,580.57	300.00	136.14	82.92	407,099.63
Arrears of pay, bounty, etc., 1900.....	189,046.98		17,533.11	51.10		206,631.19
Pay of two and three year volunteers.....	7,531.90					7,531.90
Pay of two and three year volunteers, 1899.....	140,387.42			19.64	3.52	140,410.58
Pay of two and three year volunteers, 1898 and prior years.....				27.19	86.62	113.81
Bounty to volunteers, their widows and legal heirs.....	19,721.71	300.00				20,021.71
Bounty to volunteers, their widows and legal heirs, 1899.....	71,101.82			100.00		71,201.82
Bounty to volunteers, their widows and legal heirs, 1898 and prior years.....				5.00		5.00
Bounty under act of July 11, 1862.....		100.00				100.00
Bounty under act of July 28, 1866.....	2,735.35	100.00				2,835.35
Bounty under act of July 28, 1866, 1899.....	5,270.84					5,270.84
Commutation of rations to prisoners of war, etc., 1899.....	1,116.68		1,334.70			2,451.38
Traveling expenses of California and Nevada volunteers.....	309.77					309.77
Traveling expenses of First Michigan Cavalry.....		206.21				206.21
Pay of volunteers.....		77.95				77.95
Pay of volunteers, Mexican war.....		86.04				86.04

PAYMASTER-GENERAL.

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appropriations subject to its control during the fiscal year ending June 30, 1901.

In account with the Treasury				Balance in the hands of paymasters, June 30, 1901.	Total balances, June 30, 1901.	
Amount drawn by requisition.		Amount covered into surplus fund.	Total.			Balance in the Treasury, June 30, 1901.
On Pay Department request.	On Treasury settlements, etc.					
\$40,100,750.00	\$12,835.11		\$40,113,585.11	\$7,041,920.84	\$7,314,349.50	\$14,356,270.34
369,000.00			369,000.00	18,445.04	42,571.61	61,016.65
435,000.00	1,465.48		436,465.48	264,378.28	100,407.13	364,785.41
240,000.00	4,963,032.60		5,203,032.60	5,414,094.37	134,953.42	5,549,047.79
7,800.00			7,800.00	24,040.02		24,040.02
	203,217.10		203,217.10	150,073.20	8,018.23	158,091.43
10,000.00	1,424,419.63	\$65,772.08	1,500,191.71		2,198.95	2,198.95
1,510.45	101.77	31,620.77	33,232.99			
	8,180.74	77,316.62	85,497.36		989.00	989.00
65,000.00	135,545.06	1,357,058.26	1,557,603.32		21,747.50	21,747.50
	3,548.99	19,156.71	22,705.70		612.50	612.50
		13,256.51	13,256.51			
		73.28	73.28			
		923.52	923.52			
9,500.00	70.00		9,570.00	430.00	8,080.00	8,460.00
	14.40	257.03	271.43			
200,000.00	177,874.04		377,874.04		36,422.57	36,422.57
10,000.00	17,909.65	43,495.74	71,405.39		28,608.42	28,608.42
		485.00	485.00			
1,000.00			1,000.00		533.34	533.34
1,200.00	12.00		1,212.00		1,005.00	1,005.00
					328.78	328.78
8,131.40	488.06		8,619.55	1,536.91	1,800.32	3,337.23
403,000.00	3,993.15		406,993.15	106.48	30,319.56	30,426.04
	206,580.57		206,580.57	50.62	1,002.94	1,053.56
				7,531.90	2,575.33	10,107.23
	26.19	140,384.39	140,410.58			
		113.81	113.81			
	300.00		300.00	19,721.71	3,683.60	23,405.31
		71,201.82	71,201.82			
		5.00	5.00			
	100.00		100.00		100.00	100.00
	100.00		100.00	2,735.35	200.00	2,935.35
		5,270.84	5,270.84			
		2,451.38	2,451.38			
				309.77		309.77
206.21			206.21			
	77.95		77.95		85.86	85.86
86.04			86.04			

Statement of the account of the Pay Department, United States Army, with the appro-

Appropriations.	In account with the Treasury.					Total.
	Balance in the Treasury, July 1, 1900.	Amount of appropriations and transfer warrants.	Unexpended balances deposited.	Paymasters' collections deposited.	Repayments in settlement of accounts.	
CERTIFIED CLAIMS—continued.						
Pay of mounted riflemen under Col. John C. Fremont in 1846.....		\$51.04				\$51.04
Pay, transportation, services, and supplies of Oregon and Washington volunteers in 1855 and 1856		330.14				330.14
SPECIAL ACCOUNTS.						
Emergency fund, War Department, "to disband the Cuban Army"	\$455,250.00					455,250.00
National Defense (war—mileage to officers).....	1,022.01			\$998.28		2,015.29
Total	12,120,983.00	48,755,878.68	\$2,674,386.78	\$96,318.98	\$6,372.96	64,253,940.40

priations subject to its control during the fiscal year ending June 30, 1901—Continued.

In account with the Treasury.					Balance in the hands of paymasters, June 30, 1901.	Total balance, June 30, 1901.
Amount drawn by requisition.		Amount covered into surplus.	Total.	Balance in the Treasury June 30, 1901.		
On pay Department request.	On Treasury settlements, etc.					
	\$51.04		\$51.04			
\$48.52	281.62		330.14			
	1455,250.00		455,250.00			
	12,015.29		2,015.29			
41,862,232.71	7,617,490.44	\$1,828,842.76	51,308,565.91	\$12,945,374.49	\$7,740,543.56	\$20,685,918.05

¹ These balances having been carried to the credit of the general account with the appropriations named, respectively, and being no longer available for disbursement by the Pay Department were, on June 30, 1901, dropped from its appropriation ledger.





U. S. CABLE SHIP BURNSIDE OFF DUMAGUETE, NEGROS, P. I., DECEMBER 26, 1900.

REPORT
OF
THE CHIEF SIGNAL OFFICER.

WAR DEPARTMENT,
OFFICE OF THE CHIEF SIGNAL OFFICER,
Washington, October 1, 1901.

SIR: I have the honor to submit herewith my annual report covering the operations of the Signal Corps of the Army for the fiscal year ending June 30, 1901.

The operations of the Signal Corps have been coexistent with the operations of the Army of the United States, not theoretically, but on broad lines and activities which have comprised practically the entire area, not only of the United States proper, but also of Alaska, Cuba, Porto Rico, the Philippines, and a portion of China.

The muster out of the last volunteer soldier would seem to mean a reduction of work, but in an electrical age the demand of our active and progressive generals has developed in the American Army the application of electricity to war on a scale unprecedented in military history. Incessant demands were made by military commanders for intercommunication with their detached organizations by telegraph and by telephone, in addition to the former methods of visual signaling.

While the military work of the other arms of the service speedily decreased with the reduction of the Army, the demands upon the Signal Corps steadily increased.

For convenience of reference the field operations of the Signal Corps are treated in this report geographically under the various headings of Alaska, China, Cuba, the Philippines, Porto Rico, and the United States.

MILITARY TELEGRAPH LINES AND CABLES.

Work in the United States falls under four heads, viz: Signal Corps instruction, military telegraph lines, supply depots, and electrical installation for control of artillery fire.

Only such permanent military telegraph lines are maintained in the United States as are necessary for safeguarding the frontier settlements in case of Indian outbreaks. Such lines, aggregating about 900 miles in length, are situated either along the Mexican frontier or around the great Indian reservations of the trans-Mississippi region. The report upon this subject, made by Capt. Edgar Russel, Signal Corps, forms Appendix No. 1.

The volume of business, both Government and commercial, has been very large during the past year. The tolls for commercial messages

have been collected and deposited in the Treasury without the loss of a single cent. These deposits aggregate the sum of \$2,533.34. In addition there has been collected on account of commercial telegraph companies and turned over to them the sum of \$6,173.86, due for tariffs on commercial lines, there being no loss.

The signal officer of each military department is in charge of the telegraph lines of his department under peace conditions, yet such action has not been practicable during the past year owing to the lack of officers.

The extraordinary demands for trained operators of the Signal Corps in the Philippines and China have necessitated the transfer from the permanent telegraph lines in the United States of every Signal Corps man whose health was such as to permit of foreign service. In consequence many stations have been operated by civilians, thus considerably enhancing the cost of the maintenance of these lines. These lines have remained in a serviceable condition throughout the year, interruptions being very rare and of short duration.

The permanent military telegraph lines have been, as occasion required, supplemented by temporary telegraph and telephone lines, which have been constructed and dismantled as necessity demanded. Notable among these lines was that constructed at the Presidio in connection with the return of the volunteer army from the Philippines, at the muster-out camp, hospital, and post headquarters, through which telegraphic and telephonic facilities of modern character were afforded both the Army and the interested public.

The systems of short cables, which have been laid in connection with seacoast fortifications in the more important harbors of the United States, have, as a rule, been maintained in successful operation without injury or interruption throughout the year. Serious interruptions occurred, however, in connection with the cable system of New York Harbor, which has been fouled at various points by ships' anchors. The cable has been thoroughly repaired. While occasional interruptions may be looked for in this cable, yet special efforts have been made, through the courtesy of Brig. Gen. John M. Wilson, late Chief of Engineers, to remove it to a route where injuries will be reduced to a minimum.

SUPPLY DEPOTS.

The extraordinary development of Signal Corps operations in the Philippines made it necessary to supplement the supply depot in Washington by similar depots in New York and San Francisco. The depot in San Francisco was under Capt. A. B. Dyer, Artillery Corps, until June, 1901, when it was transferred to Maj. W. A. Glassford, Signal Corps. The depot in New York has been under Capt. Samuel Reber, Signal Corps. On June 1 Captain Reber was assigned to duty on the staff of the Lieutenant-General Commanding the Army, and was relieved from his duty as signal officer, Department of the East, by Capt. Le Roy S. Lyon, Artillery Corps, who has, since his assignment, efficiently performed the duties of signal officer, and has shown great aptitude and interest in the work. The services of the above-named officers, signal officers, respectively, of the departments of California and the East, were obtained through the courtesy of Maj. Gens. W. R. Shafter and John R. Brooke. The purchase of large amounts of material, their inspection, and their shipment to the Philippines, Cuba, Porto

Rico, and Alaska has involved unusual care and in many cases a high order of professional knowledge. While these duties were performed in a most efficient manner by Major Glassford and Captain Reber, Signal Corps, yet the Chief Signal Officer feels it but proper to acknowledge the energy and success with which Captain Dyer has performed his novel and additional duties. His promptness was particularly noticeable in connection with field material for use in China. The report of the signal officer, Department of California, accompanies this report as Appendix No. 17.

FIRE-CONTROL SYSTEM FOR SEACOAST ARTILLERY.

As far as the present unsettled condition of the fire-control system made possible the Chief Signal Officer of the Army has cooperated with other staff departments in perfecting these electrical installations, so absolutely essential to the successful operation of the modern seacoast artillery for the defense of our important harbors.

Appropriations can not insure a satisfactory system in default of adequate plans for electrical installations, which it is evident must vary according to the varying physical environment at different fortifications.

No such definite system of fire-control communication having been prescribed, it has in the past been impracticable to properly fill requisitions for the component parts of such installations. The Signal Corps acts as a supply bureau only, and is not charged with problems of design, hence the Chief Signal Officer of the Army enunciates the principles which govern his actions. At the request of the Chief of Artillery, he is willing to take up the problem of electrical installation for the fire-control system of any post on plans and specifications drawn by any other branch of the service. In this latter case, however, the Signal Corps will deliver instruments and material in accordance with the specifications, but it can not be held responsible for the efficient working of any system devised by any other corps of the Army. These principles underlie the operations of commercial companies in connection with electrical installations, and embody the sound idea that the originator of the system, and not the manufacturer, should be responsible for its successful operation.

The electrical equipments of a post should be an entity, and its component parts designed and adjusted to make one united whole. It is unquestioned that if one department were charged with the various problems arising in the unification of an installation greater economy, simplicity, and efficiency would result. The reorganization of the artillery arm of the service and the designation of Col. Wallace F. Randolph as Chief of Artillery will have important results in the operations of the fire control. Steps have been taken to insure thorough cooperation between the Chief of Artillery and the Signal Corps.

SIGNAL INSTRUCTION IN MILITARY DEPARTMENTS.

Instruction in signaling in the United States has been carried on as usual on two different lines:

First, that of the simplest character in accordance with paragraph 1747, Army Regulations, under department commanders, with a view of enabling independent organizations to intercommunicate in cases of necessity.

Second, at the Signal Corps post, Fort Myer, Va., where men have been thoroughly trained in visual signaling, line building, telegraphy, telephony, etc.

The signal officers of military departments in the United States have been almost entirely officers detailed from the line who have performed signal duty in addition to their other staff duties. Reports of these officers form parts of the reports of the commanding generals of the departments.

Any deficiencies in instruction in military signaling have not arisen from lack of energy or ability, but the strictly limited number of troops within the limits of the United States have made technical military instruction practically impossible.

The Department of California remained in charge, until June, 1901, of Capt. A. B. Dyer, Artillery Corps, who performed most efficiently the duties of signal officer of the department in addition to his other duties, until relieved by Maj. William A. Glassford.

In the Department of Texas, First Lieut. H. R. Perry, aid-de-camp, has had charge of signal operations in that department since October 1, 1899, and has satisfactorily handled with promptness and ability the affairs of the military lines in the department, which he reports have greatly facilitated the transaction of public business and the operations against smugglers and desperadoes along the Rio Grande. First Lieutenant Perry was relieved from this important duty on June 29, 1901, by Capt. C. D. Roberts, Seventeenth Infantry. The report of the signal officer, Department of Texas, forms a part of this report, and is printed as Appendix No. 16.

Capt. Samuel Reber, Signal Corps, with his usual vigor, has performed an enormous amount of work in addition to his ordinary duties as signal officer, Department of the East, and has displayed the energy, zeal, and professional aptitude which have marked his services elsewhere. He has satisfactorily handled the fire-control system of the Department of the East, the most extensive of the country, and conducted with untiring interest and success experiments in the evolution of wireless telegraphy. Captain Reber has also been of great assistance to the Chief Signal Officer of the Army in the purchase and inspection of electrical instruments, material, and apparatus, intended for use in Alaska and the Philippines. This work, especially in connection with the testing of submarine cables, involved a fundamental and accurate knowledge of electrical laws, and of instrumental devices, of a rare order, possessed only by modern electrical experts.

SIGNAL CORPS POST, FORT MYER, VA.

On December 22, 1898, the Secretary of War approved the setting aside for a Signal Corps post of a portion of the Fort Myer Reservation. The ground was surveyed and formally assigned to the Signal Corps by direction of the Secretary of War, with the proviso that this Corps was to have no power as to the water, sewers, roads, or other matters affecting the integrity of the reservation as a whole.

On the ground thus mapped and formally set aside has been constructed a separate post, known as the Signal Corps post, Fort Myer, Va., whereat have been erected barracks for a force of 100 men, quarters for 3 officers, an administration building, a balloon house, and a storehouse. In these buildings have been installed a school of

instruction, wherein recruits are trained, not only as soldiers, but are qualified for service as electricians, telegraph operators, and signalmen. This action concentrates Signal Corps instruction at one point, and avoids the wastefulness, irregularity, and deficiencies, which necessarily marked the operations of the three separate Signal Corps schools at Fort Logan, Colo.; the Presidio, of San Francisco, Cal.; and at San Antonio, Tex.

The wisdom of the action of the Secretary of War has been fully justified by practical results during the past year, for without this uniform and proper training, it would have been absolutely impossible to meet the urgent demands for telegraph operators in the Philippines. There have been collected at this post all men unsuited for service elsewhere, through impaired health or insufficient training. Here also have been brought the recruits of the Signal Corps whose inclinations and aptitudes render them fit for a course in theoretical and practical electricity.

The report on the operations of this post (Appendix No. 2) is by Maj. Joseph E. Maxfield, Signal Corps, to whose ability, energy, and zeal are due the present creditable condition of the post. Under his personal supervision the arduous work of organization, instruction, and discipline has proceeded most satisfactorily. The scarcity of officers has made it necessary, however, to divert Major Maxfield at times from his important work of instruction to the almost equally important work of technical inspection of cables and other electrical apparatus of the corps.

Office and clerical work has been enormous, as the total changes in the enlisted force of the post during the year exceeded 380, thus requiring the adjustment of about 210 individual accounts of enlisted men during each month.

It being impossible to enlist sufficient operators for foreign service, it became necessary to train recruits, who are selected with regard to their intelligence, aptitude, and character. Instruction has been unceasing in telegraphy and telephony, in visual signaling, in line repair, and other Signal Corps duties. Operators are trained until they can receive 20 words per minute on practice lines, when they are sent to duty as assistants at the military telegraph stations in the United States, whence they are transferred to the Philippines as soon as they acquire confidence and skill in handling commercial messages.

Instruction in the duties of the soldier has received careful attention, and the creditable condition of the post is shown by the fact that there have been only 33 summary court cases in the year, and 5 general court-martial cases in a garrison which had numbered nearly 500 men.

Through the courtesy of the Quartermaster-General the valuable services of Maj. Theodore A. True, quartermaster, have been available in connection with the construction work. These duties were assumed by Major True in addition to his other arduous duties as depot quartermaster, yet he has performed them with such interest and skill as to insure for the Signal Corps the best possible results.

OPERATIONS IN ALASKA

The act of Congress approved May 26, 1900, provided for an extensive system of military telegraph and cable lines in Alaska, and made it necessary to extend the operations of the Signal Corps to that Depart-

Second, at the Signal Corps post, Fort Myer, Va., been thoroughly trained in visual signaling, line telephony, etc.

The signal officers of military departments have been almost entirely officers detailed from the signal duty in addition to their other staff duties. The officers form parts of the reports of the departments.

Any deficiencies in instruction in from lack of energy or ability, troops within the limits of the military instruction practically in

The Department of California of Capt. A. B. Dyer, Art, the duties of signal officer, until relieved

In the Department has had charge of 1, 1899, and in the affairs of the greatly facilitated against a tenant by C.

ned as the com- as therefrom rgy and activ- nearly coopera- Department of in Alaska despite the date of the last id or constructed:

stations built.	Dis- tance.
	Miles.
..... Davis and Port Safety	24
..... and Golsovia	35
..... Unalaklik	30
..... k to Twenty-two-mile Cabin	22
..... two-mile Cabin to Kaltag Portage	
..... Sulato	108
..... Sulato, eastward	13
..... Fort Gibbon to old station, west	13
..... Scattered short lengths between old station	
..... and Korine, aggregating approximately	
..... poles and wire	11
..... And of poles alone, no wire being strung	19
..... Fort Egbert to international boundary	11
..... Port Valdez to Station No. 3	37
..... And poles set to Ernestine Creek	13
	336

In addition, the Valdez line has been extended some miles farther north, and a detachment from Fort Egbert has cleared a trail and cut poles for a distance of approximately 60 miles in a southwesterly direction toward the head of Mosquito Creek, with a view to meeting the Valdez line near the crossing of the Tanana River at Tetling. On account of the infrequency of mail communication with these parties definite report can not be made.

It is not generally understood that the Alaska telegraph systems, while placing all the Alaskan posts in connection with the commanding general of the department when completed, would not afford means of communication with any other part of the world. To increase the value of the Alaskan system, the Chief Signal Officer of the Army conferred with the authorities of the Canadian government at Toronto with a view to the extension of the existing Canadian telegraph lines, and the establishment of cooperation in telegraphic work between the Alaskan and Canadian systems. The distinguished premier of Canada, Sir Wilfrid Laurier, showed marked interest in the views advanced by the Chief Signal Officer and expressed his desire to further any plan that would bring the two countries into closer and more cordial relations, especially in the Northwest. The matter was immediately taken up in the same spirit by the acting minister of public works, the Hon. William Mulock. After brief consideration the council approved all the recommendations of Mr. Mulock, and on its recommendation an appropriation was made by the Canadian Parliament for extending the Canadian telegraph line down the banks of the Yukon to the Alaskan boundary.

The Canadian government courteously placed in conference with the Chief Signal Officer of the Army Mr. J. B. Charleson, assistant

superintendent of public works in the Yukon district, who was charged with the extension of the Canadian telegraph line from Quesnelle to Fort Chipewyan. Mr. Charleson undertaking the extension from Dawson to the Alaskan boundary, energetically pushed the Canadian work, while on the other hand Brig. Gen. George M. Randall, commanding general of the Department of Alaska, facilitated the prompt construction of the line from Fort Egbert (Eagle city) to the Yukon boundary. Fortunate for the success of the work on the American side of the boundary was the fact that it fell upon Capt. Charles S. Farnsworth, Seventh Infantry, who carried it to successful completion, as far as his route extended, with energy and success. The Canadian authorities had the right of way to construct, but they performed their work with such promptness that on May 5, 1901, the telegraph line was completed from Dawson and Fort Egbert, thus bringing the upper part of the Yukon territory on the Upper Yukon in direct telegraphic communication with Skagway, whence by steamer news could reach Washington, and other part of the world, in four days under ordinary conditions. On September 24, 1901, telegraphic communication was established between Fort Egbert and the Upper Yukon region via the United States military telegraph and Canadian land lines, and messages were exchanged between the commanding officers at Fort Egbert, Skagway, and the authorities in Washington.

As a result of personal inspection, it developed that it is practically impossible to maintain a line from Fort Gibbon, at the mouth of the Tanana, along the great Yukon bend past the old trading post, or Fort Yukon, to Fort Egbert. After consultation, the commanding general of the department expressed his accord with the opinion of the Chief Signal Officer in this matter, and it was therefore decided to locate a line across country between Rampart city and Fort Egbert. It may or may not intersect the Signal Corps line now being built from Port Valdez to Fort Egbert. Mr. William Yanert, superintendent of construction, made a preliminary survey, and if a suitable route is selected this autumn or winter construction will begin in the spring of 1902. If such route does not materially decrease the cost of the line it will hasten its completion, as the distance from Fort Gibbon to Fort Egbert is about 450 miles, while the cross-country route, being the chord of an extensive arc, should not exceed 350 miles. Mr. Yanert found a section between Rapid City and Beaver Creek feasible for the construction of a telegraph line, it being well timbered and fairly dry. The explorations are to be continued during the summer with a view of determining whether the line can be extended to the Abercrombie trail, on the headwaters of Forty Mile Creek.

Under the supervision of Maj. John T. Van Orsdale, Seventh Infantry, there was completed, about September 15, a first-class telegraph line on iron poles of about 25 miles in length. It extends from Nome city through Fort Davis eastward to Safety Harbor, where, ultimately, it will connect with the cable to St. Michael.

It is necessary that a proviso be incorporated in the Army appropriation bill for the coming year making the appropriation for military telegraph lines and cables in Alaska available until June 30, 1903, as the Comptroller of the Treasury has decided that the appropriation expired at the end of the present fiscal year. It is not generally understood that the open season in Alaska covers only about five months during the present fiscal year, thus necessitating this provision that the work may be carried to completion.

The commanding general, Department of Alaska, most strongly recommended to the Chief Signal Officer of the Army the extension of the Alaska lines which included a cable from Skagway to Juneau. This cable makes possible efficient cooperation of the military administration, judicial system, and territorial authority of Alaska. It not only connects the military posts at Skagway with Juneau, the capital of Alaska, but enables the Territorial authorities to reach via Skagway and Dawson the points in the Yukon Valley now so remote that, as a rule, not more than two or three letters can be exchanged in a year.

The Secretary of War having authorized the laying of this very important cable, the Chief Signal Officer determined to prosecute the work after the manner of commercial companies, through cable manufacturers. The cable was laid by the contractor and opened to business August 23, 1901, but was not formally accepted by the Government, as the contract for laying required its successful operation for thirty days before acceptance.

OPERATIONS IN CHINA.

While the campaign in China occurred subsequent to the end of the fiscal year 1899-1900, yet from its importance and interest it was treated in that annual report. The Chief Signal Officer of the Army had not, however, received the official report of Maj. George P. Scriven, Signal Corps, which is appended herewith. (Appendix No. 5.)

The Chief Signal Officer thinks it unnecessary to do more than to call special attention to Major Scriven's report. Especial credit is due to Major Scriven and his officers in their diplomatic, professional, and practical efforts which carried into Pekin the first telegraph line of the allied armies. Such was the dispatch of the work that the line practically went into Pekin with the American troops, and there served for the week as the only means of telegraphic communication with the outside world.

It should be distinctly understood that this prompt establishment of telegraphic communication between Taku and Pekin could not have been made but for the generosity of the British army in supplying certain deficiencies in the Signal Corps material, which could not be carried on at one time owing to the lack of sufficient transportation for the telegraph line, about 115 miles in length.

Great credit is due First Lieut. Henry W. Stamford, Signal Corps, not only for ability as acting signal officer of the command prior to Major Scriven's arrival, but also for the skill and energy with which he personally supervised construction, maintenance, and operation of this line through a hostile country. Lieutenants Bartsch, Hastings, and Capron also contributed materially to the efficient operation and construction of the line. The United States military telegraph line was operated from the Taku forts to Pekin from August, 1900, to March 15, 1901, when the American forces withdrew from China, at which time the line was sold for \$1,575 and the proceeds covered into the Treasury of the United States.

MILITARY DEPARTMENT OF CUBA.

The telegraph lines and Signal Corps work connected with the Military Department of Cuba have remained in charge of Col. H. H. C. Dunwoody, Signal Corps, who was assigned to this important duty in

December, 1898, until May 20, 1901, when he was relieved by Capt. Otto A. Nesmith, Signal Corps, and assigned to duty at Washington, D. C., in charge of the Signal Corps during the absence of the Chief Signal Officer in the Philippines. Under Colonel Dunwoody the telegraph system of Cuba was developed to a high degree of efficiency, and in recognition of his services the military governor of Cuba, Brig. Gen. Leonard Wood, issued the following orders:

HEADQUARTERS DEPARTMENT OF CUBA,
Habana, May 20, 1901.

Upon relieving Col. H. H. C. Dunwoody, chief signal officer, from duty in this department, the military governor thanks him for the unremitting zeal and efficiency with which, having found the telegraph affairs of the island of Cuba in a state of complete chaos, he has organized, extended, and maintained them in a serviceable condition, giving prompt telegraph service to all parts of the island.

The excellent and interesting annual report of Capt. Otto A. Nesmith, signal officer of the department, is printed in full as an appendix to the report of the commanding general, Department of Cuba. In consequence, the Chief Signal Officer of the Army confines himself to a résumé of operations of the Signal Corps in Cuba, supplemented by extracts from reports (Appendix No. 6), made by Captain Nesmith under paragraph 1541, Army Regulations, on matters of current interest or special importance.

The telegraph system now operated by the Signal Corps in Cuba consists of 3,418 miles, showing an increase of 162 miles of line over the mileage for the previous year. During the American occupation the old Spanish telegraph lines in the western provinces of the island were practically rebuilt and the telegraph system extended to include the eastern provinces, placing all the military posts and principal towns in telegraphic communication with the outside world. The last and one of the most important links was the construction of the telephone line from Baracoa to Cape Maysi in the interest of commerce, the station at Cape Maysi reporting passing vessels by telephone to interested parties.

While the work of construction of new lines during the current year was limited, general repairs were continued, which improved the efficiency of the system at the close of the year. It is no exaggeration to state that the telegraph facilities in the island of Cuba compare favorably with those in the United States, notwithstanding the extraordinary efforts required to keep the lines in operation.

Communication has been maintained over the trunk line between Habana and Santiago during the year, except for occasional brief interruptions.

In the management of this Cuban telegraph system it has been the aim of the Chief Signal Officer to gradually replace the officers and enlisted force of the Signal Corps by native operators and linemen, so that when the time came for the final transfer of the service to the officials of the Cuban government there would be no interruption in the telegraph work of the island.

At the close of the fiscal year 80 per cent of the entire force were natives, either operators or linemen, although there is still great difficulty in obtaining competent native telegraph operators, and in order to maintain the efficiency it has been necessary to continue in the service a number of first-class operators from the United States.

An unusual and extraordinary test of the capacity and efficiency of the system was made on the night of November 6 in the reporting and distributing of the national election returns from the United States. The cable company turned over the news to the telegraph service for distribution over the island on condition that each station receiving news should pay \$25, one-half to go to the cable company and one-half to the operators and linemen of the telegraph service who necessarily remained up all night on the work. Excellent results followed, so that numerous telegrams were received by the chief signal officer of the department from officials and citizens throughout the island thanking the Signal Corps for the excellent and prompt manner in which the work was performed. During the previous August the commanding general of the department, in making an extended inspection tour, was able to receive full reports daily at each successive station.

The routing of the United States Porto Rico cable business over the Government telegraph lines between Habana and Santiago, by which diversion special low concessionary rates were secured, inaugurated just prior to the end of the last fiscal year and referred to in detail in the last annual report, has been continued during the year with regularity and dispatch.

The general working of the telegraph service during the year has been exceedingly satisfactory, complaints have been very few, and investigations, which have been promptly and invariably made, have proved them to be wholly without reason or of such character as to be incidental to the management of all telegraph services.

With the present increased volume of commercial business throughout the island the wires are loaded to their utmost capacity, and, while telegrams are generally dispatched with promptness as filed, traffic could be facilitated were it not that all business between eastern and western points in the island is forced to pass over one wire between Santa Clara and Santiago, as the second wire must be used for local business; and the service could be materially benefited by stringing another wire from Santa Clara to Puerto Principe, and that office could relay between Habana and the following stations: Santa Cruz del Sur, Nuevitas, Lugareno, Guaimaro, Victoria de las Tunas, Puerto Padre, and Cauto, relieving congestion on the through wire, and should the business increase in the next year in the same proportion that it has in the last this would not only be necessary, but in addition another wire would be needed to Santiago.

There were handled during the year 237,972 commercial messages and 159,719 on official business, a total of 397,691 messages, while during the previous year the military telegraph lines handled 175,313 commercial messages and 170,157 on official business, a total of 345,470 messages, an increase during the present fiscal year in the total of commercial business handled of 62,659 messages, while, on the other hand, the official business shows a falling off of 10,844, owing to the elimination of military departments on the island and the withdrawal of troops.

The above statement of the number of commercial and official messages, while it embraces the consideration of the business handled from a source of revenue standpoint, does not by any means show the actual amount of work performed by the operators of the service, since messages are necessarily relayed at 18 separate offices on the island, where they have to be both received and sent, and represent a total of 673,848, which, added to the 397,691 commercial and official business, makes a

grand total of 1,071,539 messages as the actual number handled during the year by the operators of the military telegraph service.

The actual cash received by the service from its commercial messages during the year amounted to \$79,726.63 as against \$57,712.13 received during the previous year, an increase of \$22,014.50, or an increase of nearly 40 per cent, while the value of official business would amount, reckoned at regular tariff rates, to \$113,597.81, and the other line business to \$22,664.61. These figures, however, do not show the entire financial benefit that has accrued to the Government by the maintenance of its lines, since had it not been practicable to transact this business over the Government lines, and had it been necessary to send it over the lines of the ocean cable companies the cost of official business alone would have amounted to \$269,925.11 on the basis of \$1.69 per message, as shown by the accounts of the cable company.

This showing of business transacted and revenue received and the extraordinary increase in the commercial traffic of the lines is most gratifying, not only on account of the increased income, but particularly as substantial evidence of the advancing prosperity of the island and progress in its commercial and business affairs, and continued increasing confidence engendered in the security and efficiency of the Government telegraph service.

CUBAN CABLES AND TIME SERVICE.

Colonel Dunwoody states that no part of the annual subsidy claimed by the Cuba Submarine Telegraph Company has been paid. The Chief Signal Officer, without questioning the validity and justness of this concession, agrees with Colonel Dunwoody in recommending that the payment be deferred until the form of government for the island of Cuba be definitely determined.

Through the cooperation of the Inter-ocean Cable Company the Signal Corps has given throughout the island of Cuba time signals from Washington at 12 o'clock each day. In connection with this time service a time ball has been operated at Habana through cooperation with the captain of the port.

DEPARTMENT OF PORTO RICO.

The operations of the Signal Corps in Porto Rico are shown by the final report of Maj. William A. Glassford, signal officer of the department. (Appendix No. 7.)

Maj. Glassford is entitled to great credit for the energy and ability evinced in conducting the telegraph work in the department of Porto Rico, and for the businesslike ability with which he has effected the final transfer of this branch of the service to civil control. To his energy and professional skill were due the entire reconstruction of the Porto Rican telegraph lines, after they were entirely destroyed by the destructive cyclone of August 8, 1899. The system was entirely recast, expensive and useless offices eliminated, and a system of efficient administration initiated, with a promptness of service never before known in Porto Rico. The military telegraph system of Porto Rico had been maintained, operated, repaired, and reconstructed without entailing a dollar of expense to the treasury of Porto Rico. Moneys received from commercial messages from May 1, 1900, to February 1, 1901,

were turned into the United States Treasury, as is required by law in the case of commercial receipts of the military telegraph lines in the United States.

When the civil government was installed under act of April 12, 1900, the telegraph system continued as military lines and so was maintained and operated by the Signal Corps. The Commanding General advocated its transfer to the Insular authorities, and upon the discontinuance of the island of Porto Rico as a separate military department transfer was ordered and gratuity made to the island of 806.6 kilometers of line (504 miles) valued at \$36,294.27, the cost of the rebuilding, not considering expense of transportation. This transfer was effected February 1, 1901.

These telegraph lines, such as they were, under Spanish authority, had been operated in conjunction with the mail service; it may be said that all its employees were Spaniards, or those in full sympathy with Spanish methods.

SIGNAL CORPS OPERATIONS IN THE PHILIPPINES.

It is impossible for the Chief Signal Officer of the Army to give an adequate idea of the great amount of work performed by the Signal Corps in the Military Division of the Philippines during the past fiscal year. As in previous years the duties have been the most important and extensive in the history of the Corps. Lieut. Col. James Allen, Signal Corps, remained in charge during the entire year, and the Chief Signal Officer of the Army can not commend in too high terms the ability, energy, and professional skill of this officer. In his work he was ably seconded by the signal officers of departments: Major Scriven and Capts. Edgar Russel, Daniel J. Carr, Carl F. Hartmann, Leonard D. Wildman, E. B. Ives, and Lieuts. Frank E. Lyman, jr., Walter L. Clarke, Henry S. Hathaway, and Basil O. Lenoir. Among the subordinate officers may be particularly mentioned Lieuts. Richard O. Rickard and Charles S. Wallace.

The labors of the volunteer officers, characterized by fidelity, aptitude, and skill, have ably seconded the efforts of the officers of the regular corps. Among the volunteers Lieutenants Niels P. Yurgensen, Magnus Nordquist, Burt E. Grabo, and Rush P. Wheat deserve especial mention for strenuous and well-directed labors in various lines in the field. Indeed, there is no officer in the Signal Corps, volunteer or regular, who has not acquitted himself with credit in the Philippines.

The well-directed and unremitting efforts of Colonel Allen have perfected in the Philippines a system of military telephones and telegraph and cable lines unequalled in the history of warfare as to their importance, efficiency, and extent. The military telegraph system now covers all of the important islands of the Philippine group except Paragua. It extends through more than 1,000 miles from north to south, from Seno de Bangui, Luzon, to Jolo, and without it it is safe to say that no single island, let alone any one department of the Archipelago, could be sufficiently controlled by the present military force. The almost absolute lack of intercommunication between the various islands of the Archipelago is rarely known and still more rarely realized. It is safe to say that more than half of the military garrisons of the entire Archipelago are so remote from department headquarters that under average conditions most urgent and important communications can not be received by mail in less than two months' time.

In Luzon mail conditions have somewhat improved, so that an answer can be obtained from near posts within the month; but there are a considerable number of stations in the Philippines from which nothing is received by mail for long periods, ranging from two to four months. It is thus a matter of fact and not of opinion that an adequate telegraph service is an indispensable adjunct of successful military operations in the Philippines, and apart from its absolute necessity as a means of conveying orders and directing operations it is extremely important from an economical standpoint.

It should be understood that no one of these lines has been built except when judged a military necessity by either the commanding general of the department or of the division. Indeed the number of officers and men of the Signal Corps has been so small compared with the volume of work to be done that only work of current necessity and urgency has been pursued.

In an official report General MacArthur says:

I respectfully inclose an extract from a former report, as the quickest way of expressing my views of the importance of the Signal Service. I desire to add that all subsequent experience has confirmed convictions expressed therein, and to renew the recommendation then submitted for the enlargement and perfection of the Signal Corps of the regular establishment. The splendid service of this corps makes it a matter of regret that in operations in these islands we have not had as much force from that body as is necessary. As it is, their wire service is simply indispensable. It is not too much to say that in the absence of this efficient service it would be impossible to hold this archipelago with less than 150,000 men, which is now well and efficiently performed by 60,000. We need wires, instruments, and operators everywhere, the more the better; it simplifies everything, makes unity of action possible, insures concentration of troops on threatened points and altogether is of such importance that it is impossible to say too much in behalf of its indefinite extension to the limit of possible usefulness.

If the principle of expanding this corps is admitted, the proper limit for the organization must be determined by investigation in the War Department. So far as the commissioned personnel is concerned, it would seem that it ought to be doubled at once, perhaps trebled. This, however, is a matter for careful consideration in the light of the whole situation.

The purpose of the present writing is to impress the Department with the view that successful operations in these islands, absolutely depend upon this service, in consequence of which, provision therefor should be made upon a scale commensurate with the importance of the interests involved.

In compliance with the instructions of the commanding general of the division and department commanders the telegraph lines have been extended until they aggregated on July 1, 1901, 4,851 miles, an increase during the fiscal year of 2,054 miles.

This does not, however, indicate the reconstruction work of the corps in line building, as it was necessary to replace 391 miles of wire destroyed by insurgents.

Important as are the land lines of military operations of the various islands, it would be impossible for the commanding general of the division to coordinate the energies of the various commanders if a comprehensive cable system were lacking. At the beginning of the fiscal year there was only one military cable south of Luzon, about 50 miles in length, connecting Cebu and Leyte. This condition of affairs caused Major-General MacArthur, commanding general of the Philippines, to represent to the Secretary of War the military and economical advisability of putting Manila in direct communication with the principal points of the island. The necessity therefor having been strongly reenforced by the interruption to the Eastern Extension Cable

between Manila and Iloilo, by which Manila was cut off from all telegraphic communication with the southern islands for twenty-eight days.

The Secretary of War approved the recommendation of the commanding general, Division of the Philippines, and operations speedily began.

It must be understood that every mile of this cable had to be manufactured to order in the United States, on carefully drawn specifications by the experts of the Signal Corps, and was duly inspected and then transported more than halfway round the world either by cable ship or commercial steamer to Manila and other points in the Archipelago, from 300 to 600 miles distant from division headquarters. Such energetic and well-directed efforts were made as have produced results which appear surprising in their entirety.

The military cable system of the Philippines now covers 749 miles. It connects Manila directly over our own lines with the islands of Mindoro, Marinduque, Masbate, Samar, Leyte, Cebu, Negros, Mindanao, Jolo, and Siasi with division headquarters. The island of Panay is reached over either the Eastern Extension Company via Signal Corps lines from Bacalod or direct from Manila to Iloilo, the policy being followed of respecting to the fullest extent the provisions of the concession of the Visayan grant to this company, if not strictly conforming to the retained concession, and is in its rearrangement an equity right against the Philippine government.

Among the military effects of this cable system may be pointed out the fact that it raised the department commander of Jolo from his practical condition of post commander and departmental adviser to that of a true department commander. Prior to the establishment of these cables there was scarcely a post in Mindanao that could answer any communication from department headquarters at Zamboanga in less than two months' time, there being practically no postal service whatever, the garrisons depending on the casual visits of transports, paymasters' boats, etc. As an illustration of the difference of conditions that existed prior to laying cables, and since, may be mentioned two facts: First, that the first disaster of American arms in the Philippine Archipelago, near Cagayan, was unknown in Manila until three weeks after it occurred. Second, at this same station the terms on which the surrender of an insurgent leader was completed were sent direct to the department commander, General Kobbe, from the cable ship before the shore station was established, and he was enabled to modify unsuitable terms which were about to be agreed to by the local commander. It may be added that General Kobbe stated to the Chief Signal Officer that military operations in eastern Luzon would have been practically impossible without cable lines, whereby orders were transmitted and cooperation insured.

Similar benefits have accrued within the past few months to the commanding general, Department of the Visayas, Brig. Gen. Robert P. Hughes, who found his operations against the insurgents very materially circumscribed, owing to his inability to telegraph and reach any troops in his command except those under his immediate orders in Samar. General Hughes is now in direct communication with every important island in the Department of the Visayas.

It is gratifying to report that the work of cable laying has been conducted with efficiency and success. The greatest danger to the

cable arises from careless navigation. There were five instances in which the cables have been broken by ships' anchors, while the injuries to several others are probably due to the same cause.

CABLE SHIP BURNSIDE.

The U. S. Army transport *Burnside* was taken from the transport service between New York and Cuba and Porto Rico in July, 1900. She was overhauled and refitted for cable laying at the Morse Iron Works, Brooklyn. The cable and apparatus on board of her were purchased and inspected under the immediate supervision of Captain Reber and Captain Squier, Signal Corps. It was only by strenuous exertions and technical ability of high order that these officers were enabled to prepare the *Burnside* for its departure for Manila at so early a date as September 26, when she sailed.

Captain Squier was placed in charge of cable and technical operations on board. During the long voyage to Manila he attended assiduously to the constant care and frequent tests necessary to insure the arrival of the cable at Manila in good condition.

The *Burnside* arrived at Manila December 6, 1900, and from then until December 23, by unremitting labor, the machinery was installed on board. She sailed on December 23 for the southern part of the Archipelago with Lieut. Col. James Allen, Signal Corps, chief signal officer, Division of the Philippines, on board, in charge of cable operations. Assisting him were Capts. Edgar Russel and George O. Squier, First Lieut. F. M. Jones, Second Lieuts. H. S. Hathaway and Earle W. Binkley, signal officers, U. S. Volunteers. Nineteen Signal Corps noncommissioned officers and men assisted in various technical matters on board, 11 of these being operators destined for the cable stations. A crew of 36 native laborers were employed. The division of special duties was as follows: Captain Russel, commanding detachment and superintendence of the installation of necessary offices and land lines; Captain Squier, in charge of testing and electrical researches generally; Lieutenant Jones, property and disbursing officer; Lieutenant Hathaway, office installation; Lieutenant Binkley, land-line construction.

Beginning at Dumaguete, Negros Island, the *Burnside* took soundings to Misamis, Mindanao, laying cable between these two places, a distance of about 100 knots. Captain Squier, overcoming many difficulties, laid a piece of cable from Misamis south into Panguil Bay, to connect with a land line across the isthmus of Mindanao. Soundings were taken and cables laid between Misamis, Iligan, and Cagayan on the northern coast of Mindanao, distance of about 30 and 50 knots, respectively. The *Burnside* then proceeded to repair the cable between Cebu and Ormoc, island of Leyte, which had been broken by a ship's anchor. The ship then returned to Misamis, making a repair in the short cable there and also one near Iligan, where a break had occurred, probably due to earthquake action. The *Burnside* then went to Zamboanga and laid a cable between that point and Tukuran, a distance of about 136 knots, this last-named place being on the southern coast of the isthmus of Mindanao. Meantime, under General Kobbe's direction, a land line had been constructed to connect with the northern side of the isthmus, where Captain Squier's party had landed their Panguil Bay cable end. This gave Zamboanga cable communication

with the outer world. From this point a cable was laid to Jolo, a distance of about 90 knots, bringing the Sultan's capital into communication with Manila. The ship then proceeded under orders from Manila to Bongao, our southernmost garrison, where a Government coasting vessel had gone on the rocks. This was taken off and put in good condition by the *Burnside* navigating contingent. The *Burnside* then went to Oslob on the coast of the island of Cebu, from whence a good land line extended to the Eastern Extension Cable Company's office at Cebu, and laid a short cable—20 knots—connecting with the Dumaguete end of the Government cable, giving much more certain communication with Manila. This virtually completed the cable laying, 446 knots having been laid. In laying this and in repairing, the *Burnside* had traveled nearly 3,000 miles without an accident or a serious hitch of any kind. Mr. Winter and Mr. Hamilton, two cable experts employed by the Signal Corps, had shown rare ability in meeting every difficulty. Subsequent to the cable laying, before returning to Manila, the *Burnside* repaired the Guinayangan-Pasacao cable connecting those towns on the western coast of Luzon. Through the many faults and one actual break in the conductor, that wonderful instrument, popularly known in the Signal Corps as the "buzzer," had maintained uninterrupted communication for nearly six months.

On all these short cables what is known as the "open circuit, Morse system," was used with polarized relay sets. This system was found to work satisfactorily on cables up to 140 knots in length.

It is to be noted that this cable laying was carried out successfully in imperfectly charted seas, where great irregularities of the bottom exist. The greatest depth reached was off the southern coast of Mindanao, where the cable lies in nearly 1,000 fathoms—one and one-eighth miles—in depth. These, added to the difficulties of strong and irregular currents, and navigation in the vicinity of unlighted coasts, make the achievement of the Signal Corps in this successful cable work worthy of note.

The Chief Signal Officer can not speak in too high praise of the energy and intelligence displayed by Capts. Edgar Russel and George O. Squier in performance of the arduous cable work assigned them, and most gladly accords his high appreciation of the excellent work performed by them under the able supervision of Lieut. Col. James Allen, Chief Signal Officer, Division of the Philippines.

REPORTS ON LAND LINES.

It must not be assumed that the construction and maintenance of Signal Corps land lines in the Philippines at all resembles work of this character in the United States. The lines have been built and repaired under most trying conditions of physical environment and military disadvantage. The construction has necessarily proceeded through country largely devoid of roads, and where paths and trails, scarcely passable for pack animal or Chinese porter, have been almost impossible to traverse during the prolonged storms of the rainy season. When one passes through the country interwoven by the wires of the army telegraph, the feeling of surprise arises that such lines were ever constructed. While it is a pleasure to inspect the six-wire line constructed by the experts of the Signal Corps between Manila and Dagupan in a style unsurpassed by any lines in the United States, it is still

a greater source of pleasure to see the difficulties of nature overcome by the resources of man. Especially is this true of the lines built by Captain Russel and Lieutenants Cunningham, Rickard, Mitchell, and Grabo, from San Fernando to Aparri, through the almost unknown center of Northern Luzon; by Lieutenant Stamford along Zambales coast; by Lieutenants Clarke, Cunningham, Gibbs, and Wheat, through the Laguna de Bay region; by Lieutenant Lyman, through the Camarines; by Lieutenants Clifton and Wallace, across the rugged hills of Negros and Leyte, and by Lieutenant Binkley, through the almost untraveled wilderness of Mindanao.

If the officers and men of the Signal Corps had struggled only against the natural disadvantages they were under, their work in the Philippines would have commanded commendation; but to this must be added the extreme difficulties arising from the practically constant efforts of the insurgents to destroy indispensable means of intercommunication. In the region southeast of Laguna de Bay, Santa Cruz to Atimonan and thence to the head of the Gulf of Ragay, the insurgent troops had caused no end of trouble and annoyance, not only by the cutting of the wire, but by the removal or destruction of considerable stretches of line. The commanding officer at Santa Cruz informed me that experience had caused him to furnish every repair party with at least a mile of wire, as nearly that amount was taken away at each break. Destruction of sections of 2, 3, or even 5 miles of line was not unusual, but the climax was reached in the total destruction of 38 miles of line, every insulator being broken, every bracket destroyed or removed, every pole cut down and the entire wire carried away.

That the land lines have been operated with marked efficiency under these conditions and interruptions of an entire day have been rare are due to the intelligent efforts of signal officers, supplemented by the energy, courage, and intelligence of the enlisted men of the Signal Corps, whose efforts to maintain communication for the Army are a credit to the resourcefulness and individuality of the American soldier.

Enlisted for the noncombatant's service, yet experience in the Philippines shows that the average soldier of the Signal Corps yields nothing in courage to the typical soldier of the line. The enlisted men of the Signal Corps have frequently taken their lives in their hands in individual efforts to restore lost communication. The danger is not shown by the death roll alone, which, however, through the provinces supposed to be in a peaceful condition, is large enough to be somewhat appalling.

During the past fiscal year the following soldiers of the Signal Corps have gallantly given their lives in the performance of their duty: First-Class Sergts. Robin J. Todd and Marshall S. Greene; Sergts. Albert H. Cockayne, Warren Billman, Ludlow F. North, and Joseph A. Drouin; Corpl. Charles A. Wilson; Privates William B. McElhager, George W. Patton, William F. Stevens, John H. Taylor, Elmer E. Keelhorn, John B. Tracy, and James H. O'Donnell.

One officer, Lieut. John Kennedy, was accidentally killed, and Lieut. William E. Davies was wounded in action.

Nor should it be understood that the native linemen who have cast their lot with the Signal Corps have been exempt from danger or lacking in courage. Many of these men have been faithful unto death.

Details as to conditions under which men of the corps have labored in office and in field are to be found in extracts from reports of Col. James Allen, which forms Appendix No. 8 of this report.

INTERNATIONAL CABLE REGULATIONS.

In connection with the proposed American-Pacific cable recommended by the President for the favorable consideration of Congress, the Chief Signal Officer invites attention to the fact that the subject of the rights, privileges, and immunities of submarine-cable property in time of war was brought to notice during the Spanish-American war, and should properly be a matter of consideration for an international cable conference. Such a conference for the protection of submarine cables was held at Paris in 1884, and its proceedings, transmitted to Congress by the President on January 9, 1889, were subscribed to by the United States and by twenty-five other principal nations of the world.

Article XV of this conference, however, specially states that "the stipulations of this convention shall in nowise affect the liberty of belligerents," which leaves cables in time of war without adequate international regulations to meet the complicated conditions.

In view of the present enormous extension of submarine cables, aggregating in the British Empire alone the value of \$30,000,000, such a conference could properly consider other international cable matters. A standard international cable code could replace numberless codes now in use. A single code constructed on scientific lines would materially increase the working capacity and efficiency of submarine cables. It should avoid words liable to telegraphic errors, whether transmitted by the European or American alphabet, and those which badly transcribed lead to errors in reading. By selecting suitable code words the speed of code messages could be increased from 20 to 30 per cent with equal or improved legibility.

AMERICAN TRANS-PACIFIC CABLE.

The United States and its remote colonies should be connected by a Pacific submarine cable, as recommended by the President to Congress in his special message of February 10, 1899.

It is only a matter of time when Luzon shall be connected with Japan and Tonkin and the Chinese Empire. The Philippine Islands are now only accessible telegraphically over a short cable of about 600 miles of the Eastern Extension Company between Manila and Hongkong.

The experiences of the War Department in connection with the relief of the legation at Peking show clearly the tremendous disadvantage under which the United States would labor without its own cable facilities in case of an extended war in the East.

An American trans-Pacific cable is a military and commercial necessity if American interests are to be safeguarded in Asiatic regions. Such a cable, while of great value militarily, will especially foster industrial interests and facilitate commercial operations.

As it is officially known that an American cable can only enter Japan from the east and not from Russia, China, nor the Philippines, the only possible route is that already recommended to Congress by the President, via Hawaii and Guam.

In connection with cable operations in Cuba and the Philippines the Signal Corps has had practical experience in the construction, installation, and operation of cables such as has never been enjoyed by any other body of officers and men outside of the few experts of the great cable corporations of the world.

In the telegraphic operations of the Signal Corps since the commencement of the Spanish-American war have been involved about 1,400 miles of cable, two-thirds the amount necessary to connect San Francisco and Honolulu. In cable matters, as in all other technical construction, the Chief Signal Officer follows the wise rule of relying on the skill, judgment, and experience of the experts of the great manufacturing establishments, thus securing successful installation by experts whose lives are given to technical work. In Cuban and Philippine waters during war conditions it was necessary for Signal Corps officers to do the entire work. They have been most fortunate in their operations, as not a single mile of cable has been lost, either in laying or recovering, nor has there been any serious interruption in the working of these cables.

Four officers of the Signal Corps, Lieut. Col. James Allen, Maj. Joseph E. Maxfield, Capts. George O. Squier and Edgar Russel, have especially applied themselves to the attainment of knowledge respecting the electrical and physical constants of submarine cables, the best methods of operation, the lines along which invention is advancing cable operations, and upon other matters relating to the subject. The successful efforts of these officers have enabled the Chief Signal Officer of the Army to bring together a collection of data that must be of great value and importance to whatever officers of the Government may be charged with the construction, laying, and operation of such cables or the supervision of the work if done by contract. It is believed that the trans-Pacific cable should be thoroughly American in its manufacture, installation, and operation.

INTERNATIONAL TELEGRAPH CONVENTIONS.

The next international telegraph conference is to be held in London in 1902, and it is most urgently recommended that the United States adhere to the International Telegraph Union, and that steps be taken by Congress to authorize the War Department to join and be represented thereat.

While under the regulations any state may adhere to the convention on request, and may renounce its adhesion, yet nations not belonging, such as the United States, can only submit views through a proposal, which views must be seconded by one of the contracting states, conditions which are incompatible with the dignity and standing of this nation.

As compared with the contracting states the United States is now at a distinct disadvantage in the use of cables and land lines which pertain to the Union. In time of war or in serious exigencies the United States has to yield in priority to the official messages of agents of all contracting states, as under the regulations telegrams of contracting states take precedence.

The International Telegraph Union furnishes the contracting states gratuitously all information relative to international telegraphy, such as interruptions, restorations, etc., and the United States has been obliged for years past to obtain such valuable information second-hand and as a favor, if at all. The expense of the maintenance of the International Bureau is borne by the different states, and would probably not exceed a few hundred dollars per year for the United States. The amount could be paid from the telegraphic expenses of the Signal

Corps if authority be given, or the expenses could be met, as in other countries, by the additional charge of 1 cent on each message over United States lines, as was regularly done in Cuba, Porto Rico, and the Philippines. Prior to the Spanish-American war Porto Rico and the Philippines participated in the advantages of this union, and there seems to be every good reason why they should continue to adhere, especially in view of the fact that foreign cables reaching these Islands conform to the regulations of the International Telegraph Union.

WAR DEPARTMENT TELEGRAPHIC CODE.

Under the provisions of paragraph 1741, Army Regulations, the Chief Signal Officer of the Army is charged with the preparation, distribution, and revision of the War Department telegraphic code.

The extraordinary telegraphic expenses of the War Department in late years make this a work of great economical importance.

The preparation of this code has devolved upon the Chief Signal Officer personally, as there was no other available officer having knowledge of telegraphy, combined with a familiarity with military usages, special vocabularies, and the cable regulations and methods of the world.

In the preparation of the War Department telegraphic code care has been taken to omit words which, either in the Continental Code or American Morse, are of such telegraphic character as to lead to errors, whether in the transmission of cipher messages or from defective transcription. The War Department telegraphic code is supplemented by the Western Union telegraphic code, and from time to time appendices have been issued, as the code is not yet perfected. It includes about 25,000 sentences that are frequently used in military correspondence. On an average each cipher word represents about seven words in plain text. The necessity for economy is apparent, as official cablegrams to the Philippines cost \$2.25 for each word, including address and signature.

Specially prepared tables reduce the length of official messages to a minimum. In connection with certain classes of business a single word acknowledges the messages and conveys to the sender the action taken thereon. Nearly every officer in the Army has a single code word assigned to him, and the same course is followed with each separate military organization. For instance, the code word "nettarhine" means "Company A, Twenty fifth Regiment, United States Infantry;" the word "novercabor" means "Your requisition of 21st received and will be filled immediately;" the code word "krausbart" means, "With reference to your telegram of the 28th, your recommendation approved," and the word "kreuzen," "With reference to my telegram of the 19th, take no action until further orders."

Although primarily a code for economy, yet the War Department telegraphic code is available for enciphering important confidential messages where secrecy is desired. Each code word has a number, so that any method, either simple or complex, of enciphering by key numbers can be readily used.

EXPERIMENTAL WORK.

Experimental work along lines of prospective value in time of war *has naturally* been intermittent in the face of military conditions *demanding* in the field the utmost effort by every available officer and

man. Such attention has been given when possible, especially in directions promising early usefulness for field operations.

In wireless telegraphy the Signal Corps has perfected its own system, which was the first one ever successfully operated in the United States, on September 30, 1899, between Fire Island and Fire Island light-ship, a distance of 10 miles. There are now in successful operation two stations in San Francisco Harbor, one at Fort Mason and another at Alcatraz Island. Arrangements have been made for the establishment of stations in the Philippines at suitable points.

The Chief Signal Officer adheres to the opinion that this system has its limitations, which are not entirely dependent on distance.

Experimental work has also been conducted in connection with automobiles, of which three with gasoline as a motive power have been purchased by the Signal Corps. While the conditions of the Signal Corps are such as to render the use of electrical power most advisable, yet, owing to the difficulty of recharging the batteries in the field, it seems probable that most Army automobiles must be dependent on another motive power than electricity.

Experiments have been made in the Philippines with a view to determining the value of acetylene gas for visual night signaling. The acetylene light in conjunction with the heliograph forms the means by which communication has been kept up in the Philippines between the islands of Cebu and Bohol.

A board of officers appointed by the Chief Signal Officer for the consideration of various problems of design of instruments and the framing of specifications for Signal Corps supplies has, during the past year, submitted reports from time to time. A portable wall telephone and a new portable field telephone have been devised, and contracts let for making a number of these instruments. There have also been made specifications for various cables required for fire control uses and other purposes.

TELEGRAPH AND CIPHER BUREAU OF THE WHITE HOUSE.

The telegraph and cipher bureau of the White House to place the Commander in Chief of the Army and Navy in quick and direct communication with the forces on land and sea, and with our diplomatic representatives abroad, has remained under the immediate supervision of Capt. Benjamin F. Montgomery, Signal Corps, whose report forms Appendix No. 11.

Of this most important and confidential branch of the service the President, in his annual message of December 5, 1898, said: "This service was invaluable to the Executive in directing the operations of the Army and Navy."

Twenty-five telegraph wires, several of which are duplexed, and fifteen telephone cables connect the Telegraph and Cipher Bureau with the departmental lines of the Government and with commercial companies of the country.

SIGNAL CORPS EXHIBIT AT THE BUFFALO EXPOSITION.

The Chief Signal Officer of the Army found it impossible to spare an officer of the Signal Corps for duty with the Pan-American Exposition. By special direction such an exhibit of the instruments and

work of the Corps has been made as was possible. The exhibit is under the efficient charge of Capt. P. C. Harris, United States Army, assisted by First Class Sergt. Harry W. Chadwick, Signal Corps, United States Army, who had immediate supervision of the Signal Corps exhibit. Daily exhibitions were given of the practical application of wireless telegraphy and frequent night exhibits of visual signaling through recently perfected acetylene lanterns. Sergeant Chadwick's report accompanies as Appendix No. 20.

DISBURSING AND PROPERTY DEPARTMENT.

Capt. Eugene O. Fechet was the disbursing and property officer of the Signal Corps during the past fiscal year, but was relieved in July, 1901, for duty in the Philippines. In his report, which forms Appendix No. 14, is a general statement of receipts, disbursements, and of the principal shipments during the year.

The Signal Corps supplies for the Philippines and China, often urgently needed, have been purchased, inspected, and shipped under Captain Fechet's supervision, with an efficiency and dispatch that evince his executive ability. He has been a most valuable assistant to the Chief Signal Officer of the Army through his resourcefulness and business efficiency. His money responsibility during the year aggregated \$1,334,894.91.

ESTIMATES

The estimates for the fiscal year ending June 30, 1903, aggregate \$165,000.

These estimates show a reduction in the expenditures of the Signal Corps as compared with the fiscal year 1899-1900, 1900-1901, 1901-1902, for which expenditures are estimated, respectively, at \$275,000 for the first named year and \$685,000 for the last named year.

The construction of an extensive telegraph system in Alaska and the great extension of the Philippine lines necessarily demand increased appropriations for their maintenance and operation. In addition to the ordinary expenses of the Corps, which are estimated at \$140,000, there are incorporated \$25,000 to enable the Signal Corps to carry out the duties devolving upon it in connection with the installation, operation, and maintenance of electrical communications connected with the fire control of the coast artillery.

Expenditures connected with the military telegraph and cable lines in Cuba are almost entirely met from the insular funds of the island. The expenses, however, connected with the duties of the signal officers of the various departments, and all installations for artillery posts and other military stations in Cuba are met from the appropriation for the Signal Corps.

Steps have been taken to similarly reduce expenses in the Philippines.

OFFICE OF THE CHIEF SIGNAL OFFICER.

The Chief Signal Officer can not commend too highly the professional ability and skill with which Maj. Richard E. Thompson, Signal Corps, has performed the important duties of assistant to the Chief Signal Officer during the year. He was specially charged with the administration of the mustering division, embracing the commissioned and

enlisted force of the Signal Corps, and his practical experience in the field in the Philippines, where he rendered distinguished service, has given him a keen insight as to the requirements of the Signal Corps. In addition to these duties he was also president of the board on electrical devices, which prepares all plans and specifications and investigates and reports on all technical matters, instruments, and apparatus required by the Signal Corps in its various branches, including electrical appliances in connection with the system of fire control.

Contrary to anticipations, the clerical work of the Signal Office has not diminished in volume during the past fiscal year. It was hoped that when the vast amount of correspondence and other clerical work incident to the discharge of the Volunteers and the reenlistment of an entire new Corps should have been completed, the amount would decrease materially. Such, however, has not been the case, and the extension of the operations of the Corps to Alaska makes it evident that the work for the coming year will be, if anything, in excess of that for the past year.

The enlistments, transfers, and changes in the personnel of the Corps cause extensive correspondence which, owing to the technical qualifications required of applicants, has necessarily been transacted through this office. These changes also involve much work in the keeping of the card records of the officers and enlisted men.

The work of examining and auditing the money accounts and property returns, while continuing enormous, has been lessened by the introduction of a card index and envelope system.

The insanitary condition of the rooms occupied by the Signal Office, as pointed out by the Chief Signal Officer in his last two annual reports, has in no way been relieved.

The same cheerfulness and willingness to work has continued, and no one has availed himself of the full amount of leave allowed him by law. The promotion of Mr. George A. Warren to be chief clerk has been a proper reward for faithful and efficient service of many years.

The office has been fortunate to secure the services, by transfer from the Paymaster-General's Office, of Mr. Clarence F. Cobb, clerk, Class 4, whose ability as an accountant has been recognized for years.

The present office force can not be reduced without injury to the public service and the consequent neglect to its business. It is to be sincerely hoped that the next Congress will provide a permanent force, so that each clerk, feeling secure in his position, will take more personal interest in the work to which he may be permanently assigned, as under the present system and its repeated changes and the uncertainty of permanency it is impossible, however capable a clerk may be, to accomplish the same work as under permanent conditions.

The following permanent clerical force is absolutely necessary for the proper performance of public business in the Signal Office: One chief clerk at \$2,000; one clerk, Class 4, at \$1,800; two clerks, Class 3, at \$1,600 each; two clerks, Class 2, at \$1,400 each; four clerks, Class 1, at \$1,200; four clerks at \$1,000 each; one messenger at \$840 and two assistant messengers at \$720 each; one laborer at \$660.

VOLUNTEER SIGNAL OFFICERS.

The changes which have occurred among the volunteer signal officers are shown in appendix 13. The only fatal casualty was that of

Second Lieut. John Kennedy, who was killed in the line of duty by a railway accident near Gerona, island of Luzon, P. I., on November 24, 1900, after service as an officer full of credit to himself and the Signal Corps.

The majority of the volunteer officers have been transferred to the Signal Corps under the provisions of the act of Congress approved February 2, 1901. Of the volunteers, Lieuts. John J. Ryan and John T. Sayles have had their faithful services recognized by appointments in the line of the Army.

The success of the Signal Corps has, in a large measure, depended upon the fidelity, ability, and professional zeal with which the volunteer officers have performed the onerous and dangerous duties in Alaska, Cuba, Porto Rico, China, and the Philippines.

THE REORGANIZATION OF THE SIGNAL CORPS.

The Signal Corps has been reorganized under the act of Congress approved February 2, 1901, and its personnel is shown in appendix No. 12. The Corps now consists of 1 brigadier-general, 1 colonel, 1 lieutenant-colonel, 4 majors, 14 captains, and 14 first lieutenants. The only changes that the chief signal officer would suggest is the addition of 1 colonel, 1 lieutenant-colonel, and the reduction of 1 major, 1 captain, and 1 first lieutenant. This change would make the net reduction of 1 officer, and would rearrange the Corps in a manner which it is believed would better contribute to the efficiency of the service.

The following table shows the proportion of field officers to the total in each staff corps named below:

Quartermaster's Department, percentage of field officers	36.4
Commissary Department, percentage of field officers	36.4
Medical Department, percentage of field officers	24.9
Pay Department, percentage of field officers	51.0
Corps of Engineers, percentage of field officers	30.6
Ordnance Corps, percentage of field officers	31.0
Signal Corps, percentage of field officers	17.1

Compared with the Corps of Engineers and Ordnance Corps, whose relation to the other branches of the service is somewhat similar, the Signal Corps has but little less than half their proportion of field officers.

The incentive to the best service for officers below the grade of major is thus markedly disproportionate. It is submitted that in view of the character of the services rendered that the Signal Corps should receive due recognition in this regard.

The Chief Signal Officer of the Army gave most critical examinations to the official records of all volunteer officers, with the sole view of increasing the efficiency and standing of the Signal Corps.

It is only due to the Secretary of War to state that the Chief Signal Officer had his constant and unfailing support in this difficult task of reorganization, so that the final responsibility for an efficient corps rests with the Chief Signal Officer himself.

ENLISTED MEN.

The reorganization of the Signal Corps fell heaviest on the enlisted men. The testimony of many officers of the line, from lieutenant to general, justifies the Chief Signal Officer of the Army in stating that

there has never been brought together in the United States Army a body of men of like number whose ability, character, and professional zeal have exceeded in these qualities as developed by the enlisted men of the Signal Corps, from Alaska to Cuba and from Porto Rico to the Philippines. As noncombatants, they have displayed instances of valor which have received the applause of the men of the line with whom they have served, and that this valor was notable is evidenced from the fact that the loss by strict war casualties of killed, wounded, and captured has been proportionately greater from the noncombatant Signal Corps than from the combatant line of the army.

Many of the men have been commended for gallantry and efficient service in the Philippines, and the reduction of such men in rank and pay was the most painful duty imposed upon the Chief Signal Officer in many years. Every effort was made to alleviate the condition of affairs by granting to first-class sergeants and sergeants their discharges upon application, and in this manner 44 reductions were obviated. It was, however, necessary to reduce in rank and pay 181 first-class sergeants, sergeants, corporals, and first-class privates, of whom 148 had served in China and the Philippines. The effect has been to deprive the Signal Corps of many of its best men, the feeling having been engendered, not wholly unjustified it must be said, that the average pay given is incommensurate with the value of the services rendered.

ARMY AND WAR DEPARTMENT LIBRARY.

This valuable collection is becoming more useful, not only to the Department, but to the Army at large, which now furnishes from its contingent fund nearly all the books purchased, hence the propriety of extending the circulation of these books to all the officers of the United States Army wherever stationed, which privilege was granted by General Orders, No. 21, War Department, Adjutant-General's Office, series 1894, soon after the supervision of the library had been assigned to the Chief Signal Officer.

GROWTH.

Though established in 1800, this library seemed to make slow progress until it found a permanent home in its present quarters February, 1888, since which time the number of books has been doubled, and now amounts to more than 42,000, with an annual increase of over 2,000 for the year ending June 30, 1901, including 978 by purchase, 777 by exchange, and 400 by donation. To this may be added 1,000 pamphlets, including periodicals.

CROWDED QUARTERS.

The great increase of volumes during the last years has been accompanied with an actual decrease of space allotted to the library resulting in a degree of congestion detrimental to good service. Surely the value of this library to the Army and to the Department is sufficient to insure a reasonable amount of room for the proper performance of its varied functions.

CIRCULATION.

The Acme library card pocket system has been applied to the books in the greatest demand, effecting considerable saving in time and effort at the charging desk. The number of loans to army officers and Department employees during the year was about 7,000.

EXCHANGES.

Many foreign military periodicals and domestic exchanges, both military and historical, are received by the library, under the law of January 12, 1895, including valuable literature relative to all the wars in which our country has been engaged.

READING AND REFERENCE.

The reading-room feature introduced in 1899 adds much to the attractiveness of the library and to the interest of those desirous of keeping in touch with the latest thought in current literature. Consulting students, including prominent writers, frequently express their high appreciation of the ready facilities offered by the open alcoves so well supplied with standard works of reference. The number of books consulted during the year was 7,226.

CONGRESSIONAL DOCUMENTS.

This library has one of the finest collections of Congressional documents in existence, containing every volume but one issued from the beginning of the Fifteenth Congress to the present time, and every original journal of the first fourteen Congresses, except the House Journal of the Second Congress, second session. Its collection of the documents and reports of the first fourteen Congresses, known as "State Papers," will compare favorably with that of the best libraries in the country. An elaborate finding list of these early Congressional papers, prepared under the direction of the Chief Signal Officer, has been issued in the form of Senate Doc. No. 428, Fifty-sixth Congress, first session, which, despite some errors incident to the first edition of such a work, will prove of great assistance to students interested in the early history of our country.

WAR DEPARTMENT DOCUMENTS.

Nearly all the publications issued by the War Department are received, temporarily stored, and carefully distributed by the document division of the library under special supervision of the Chief Signal Officer. The efficient work in this important division is due to the fidelity and indefatigable industry of the shipping clerk, Mr. F. A. Schneider, and his faithful assistant, Mr. John Shaw, who have been working at a great disadvantage ever since the loss of our regular shipping room three years ago, which threw all the labors of distribution into the law library room and the adjacent corridors. The appearance of these corridors is a striking object lesson demonstrating the need of additional room for the proper performance of library duties.

Congressional action is still needed to enable the National Guard to obtain at their own expense the military publications of the War Department, which are now issued in limited numbers and charged to the printing fund of the War Department.

WAR DEPARTMENT PHOTOGRAPHS.

The library contains a file of over 8,000 photographs and negatives relating to the war for the Union as well as a large number of photographs connected with the Spanish-American war and Philippine operations. These valuable collections are carefully preserved and so arranged that any single photograph can be readily reproduced where in exceptional cases such action would be in the public interests or as a proper concession to surviving relatives, and then only under rigid restrictions insuring the safety of the negatives. Subject Catalogue No. 5 is a valuable finding list of the civil war photographs in this collection.

LIBRARY STAFF.

The Chief Signal Officer of the Army notes with pleasure a marked improvement in the general administration of the library and a largely increased clientage of appreciative readers, which indicate the kind of work done by Mr. James W. Cheney, the librarian, whose earnest efforts have been seconded by Miss Caroline W. Kreuttner in the work of accessioning, cataloguing, and original research; by Mr. H. H. House, as assistant reference librarian; by Miss Nannie C. Barndollar, at the charging desk, and by Miss Irene F. Dashiell, as stenographer. The other employees have also rendered acceptable service, considering their inexperience in library methods.

The best results, however, can not be expected until the library force is placed upon a permanent foundation and selected with special reference to technical qualifications. At least four assistants should be provided for, as follows: Principal cataloguer, \$1,200; two expert typewriters, one of whom shall be a stenographer, \$1,000 each; and a clerk in charge of reference division, \$1,000. In addition to the above, an experienced shipping clerk, at \$1,000, is indispensable to the requirements of a large distribution authorized by the Secretary of War.

A. W. GREELY,

Brigadier-General, Chief Signal Officer of the Army.

The Hon. ELIHU ROOT,
Secretary of War.

LIST OF APPENDICES.

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2. Report of Maj. Joseph E. Maxfield, Signal Corps, commanding Signal Corps post, Fort Myer, Va.
3. Report of Capt. Frank Greene, Signal Corps, chief signal officer, Department of Alaska, on operations of the Signal Corps in Alaska.
4. Extracts from report of Capt. George C. Burnell, Signal Corps, in charge of telegraph construction along the route of the trans-Alaskan military road.
5. Report of Maj. George P. Scriven, Signal Corps, on operations of the Signal Corps in China.
6. Extracts from report of Capt. Otto A. Nesmith, Signal Corps, on military telegraph lines in Cuba.
7. Final report of Maj. W. A. Glassford on Signal Corps operations and military telegraph lines in Porto Rico.
8. Report of Lieut. Col. James Allen, Signal Corps, on signal operations and military telegraph lines and cables in the Philippines, with extracts from monthly reports and statistical tables.
9. Extracts from reports of Capt. George O. Squier, Signal Corps, on cable operations in the Philippines; extracts from report of Capt. Edgar Russel relative to daily operations on cable ship *Burnside*; also report of Captain Squier upon the growth of gutta-percha in the Philippine archipelago.
10. Report of Capt. E. B. Ives, signal officer, Department of Northern Luzon, P. I.
11. Report of Capt. Benjamin F. Montgomery, Signal Corps, in charge of telegraph and cipher bureau at the White House.
12. List of officers of the Signal Corps, United States Army, as reorganized under act of Congress approved February 2, 1901.
13. List of Signal Officers of Volunteers in service during the year ending June 30, 1901.
14. Report of Capt. Eugene O. Fehet, Signal Corps, on the disbursements of Signal Corps appropriations and allotments.
15. Report of Capt. Edgar Russel, Signal Corps, in charge of the auditing division of the Signal Office, Washington, D. C.
16. Report of Capt. C. D. Roberts, signal officer, Department of Texas.
17. Report of Capt. A. B. Dyer, signal officer, Department of California supplemented by report of Maj. W. A. Glassford, Signal Corps; also extract from report of 1st Class Sergt. Frank E. Peters, Signal Corps, on wireless telegraphy.
18. Report of Capt. LeRoy S. Lyon, signal officer, Department of the East.
19. Report of Capt. Daniel J. Carr, Signal Corps, on military telegraph lines in charge of the signal officer, Department of Colorado.
20. Report of Sergt. H. W. Chadwick, Signal Corps, on Signal Corps exhibit at the Pan-American Exposition, at Buffalo, N. Y.
21. Progress map of the Signal Corps telegraph lines and cables in the Philippines.
22. Map of Cuban telegraph lines operated by Signal Corps.

APPENDIX No. 1.

REPORT OF CAPT. EDGAR RUSSEL, SIGNAL CORPS, ON THE UNITED STATES MILITARY TELEGRAPH LINES OF THE UNITED STATES.

WASHINGTON, July 1, 1901.

SIR: I have the honor to submit the following report on military telegraph lines within the United States.

These lines have an aggregate length approximating 900 miles. For convenience of administration, the several sections are controlled by department signal officers.

DEPARTMENT OF CALIFORNIA.

Capt. A. B. Dyer, artillery corps, was acting signal officer, department of California, during this period, with headquarters at San Francisco, Cal.

The telegraph lines and cables of this department are located at or in the vicinity of San Francisco and are operated in connection with the defenses of the harbor.

The telegraph lines at present consist of a wire from department headquarters through Fort Mason to the Presidio, and thence to Fort Baker, Fort McDowell, and Alcatraz Island, over one of the strands of the three-conductor cable.

The telephone line connects the same points, using a second strand of the cable.

The Signal Corps permits the quarantine officials at Angel Island to use temporarily the third strand of its cable between Angel Island (Fort McDowell) and the Presidio, at which latter point it connects with the city telephone system.

DEPARTMENT OF THE COLORADO.

The lines of this department were in charge of Capt. John B. Bennet, Sixteenth Infantry, from July 1, 1900, to November 5, 1900; Capt. C. A. Varnum, Seventh Cavalry, from November 5, 1900, to November 19, 1900; Lieut. C. McK. Saltzman, Ninth Cavalry, from November 19, 1900, to March 1, 1901, at which date he was succeeded by Capt. D. J. Carr, Signal Corps, who has since been in charge as signal officer, with headquarters at Denver, Colo.

At the close of the year there are in operation in this department six sections of military telegraph lines, one branch telegraph, and one telephone line, aggregating 516½ miles, as follows:

Holbrook-Wilcox section.—This section is 268 miles long; it extends from Holbrook, Ariz., on the Southern Pacific Railway. At San Carlos, 105 miles north of Wilcox, Ariz., it connects with the Gila Valley, Globe and Northern Railway wire.

General repair parties from Forts Grant and Apache, Ariz., gave this section a thorough overhauling during the year; it is now in fair working condition.

Hellners-Mammoth branch.—This branch of the Holbrook-Wilcox section, connecting Mammoth, Ariz., with the commercial telegraph lines of the country, is 34 miles long, and is operated by a repeater at Hellner's ranch, 56 miles north of Wilcox.

Price-Fort Duchesne section.—This section is 87 miles in length and extends from Price, Utah, on the Rio Grande Western Railway to Fort Duchesne, Utah. It affords telegraphic communication with Fort Duchesne as well as with the Indian agencies now there. This line is now operated both as a telegraph and telephone line. Telephones are located at Duchesne bridge, the Wells, and Lee's ranch, and also at the terminals, Fort Duchesne, Utah, and Price, Utah.

Bisbee-San Bernardino section.—This section is 42 miles in length; it extends from Bisbee, on the Arizona Southeastern Railway, to San Bernardino, Ariz.

On July 1, 1899, when the detachment of troops was removed from San Bernardino, the services of the telegraph operator at Bisbee were no longer required and the military telegraph office was closed.

The Chief Signal Officer of the Army authorizing, an agreement was entered into with the Bisbee Improvement Company on March 1, 1901, by which the company

agreed to operate this line, keep it in repair at its expense, and furnish free service for official business of the different departments of the United States and their agents, between Bisbee, San Bernardino, and Naco, Ariz. This agreement may be terminated by either party upon written notice of thirty days.

Fort Huachuca-Huachuca section.—This line is owned by the Western Union Telegraph Company. It is leased from that company without cost to the United States and is operated telegraphically. It is 7 miles in length and connects Fort Huachuca with Huachuca Siding. Telegraphic communication was discontinued on June 23, 1899, owing to the fact that no Signal Corps men were available as operators. This line was telephonically operated after the above date. As the service was unsatisfactory, it was discontinued about October 20, 1899. From that date until April 29, 1901, the post was without means of electrical communication. On request of the commanding general of the department, telegraphic communication was reestablished April 29, 1901.

Fort Bayard-Silver City telephone line.—This line is 13 miles in length and connects Fort Bayard with the Commercial Telegraph System at Silver City and Bayard, N. Mex. It was telegraphically operated until January 1, 1900, when it was changed to a telephone line owing to the scarcity of Signal Corps men for duty in the United States. A civilian is employed as transfer operator at Silver City. The operator at Bayard Station receives no compensation. The telephones have thus far given general satisfaction. There is also a telephone line 2½ miles long from Fort Bayard to Bayard Station, the shipping point for the post.

Fort Wingate-Wingate Station section.—This line is three miles long. It connects Fort Wingate with Wingate Station on the Santa Fe Railroad.

Fort Yates-Bismarck section.—This line connects Fort Yates, N. Dak., with Bismarck, 60 miles from the post. It has been operated continuously during the year. It is in good repair.

There has been a decrease in the receipts both for "this" and "other" lines in the department of the Colorado during the year, caused by the loss of tolls for messages from and to Globe, Ariz. The Gila Valley Globe and Northern Railway built a telegraph line from Bowie Station, Ariz., to San Carlos, and connected there with the line of the Globe and San Carlos, thus diverting the business from the military lines.

DEPARTMENT OF TEXAS.

The lines of this department were in charge of Capt. H. R. Perry, Twenty-ninth Infantry, acting signal officer, with headquarters at San Antonio, Tex.

The lines operated were as follows:

Fort Bliss-El Paso section.—This line is six miles long and connects Fort Bliss with the city of El Paso. At the outbreak of the Spanish-American war the line was transformed to telephone, but has been in operation again since April 16, 1901. The line is used only for the transmission of messages from the Western Union office at El Paso to Fort Bliss. The line is in good condition.

Spofford Junction-Fort Clark section.—This line is nine and one-half miles long, connecting Fort Clark with the Western Union system at Spofford Junction. This line is of great military and commercial benefit, as it is the only communication with Fort Clark, there being no telegraph office in the town of Brackettville, situated one-quarter mile from the post. The line has been in operation during the entire year without interruption. Some repairs are needed which will be made during the coming year.

Fort McIntosh-Fort Brown section.—This line extends from Laredo (Fort McIntosh) to Brownsville (Fort Brown), following the Rio Grande a distance of two hundred and nine miles, connecting with the Western Union Telegraph Company at the above-mentioned places. The Western Union Telegraph Company has free use of the line for its commercial business and in consideration thereof supplies offices and operators at Laredo and Brownsville.

This agreement was made between the Western Union Telegraph Company and the Chief Signal Officer of the Army on July 1, 1896, and has worked very satisfactorily. A sergeant of the Signal Corps is stationed at Fort Ringgold, who acts as chief operator of the line. The line was thoroughly overhauled and repaired during the year, and is now in excellent condition.

The line is indispensable in the transaction of Government business, as it is the only communication between the garrisons at Forts Ringgold and Brown. In the transaction of commercial business the line has been of great benefit to the citizens of Brownsville and to settlers along the Rio Grande. Civil officers have often been aided in the apprehension of criminals, so numerous along the border.

Reports show that during the year 18,093 commercial and 12,837 free messages were handled in the department of the Colorado; and 13,928 commercial messages and 3,182 free messages in the department of Texas; \$2,022.82 line receipts have been covered into the Treasury during the year, and \$3,041.67 collected at the various offices in the departments of Colorado and Texas on account of messages destined to points on commercial lines turned over to the proper officers of the commercial companies.

In the department of California there are no receipts of "this line" tolls, and the operators in charge of telegraph offices settle in person with the Western Union Telegraph Company for cash collected for messages destined to points on their lines. During the year 5,325 commercial messages and 32,172 free messages were handled in this department, and the sum of \$2,031.80 turned over to the proper officers of the Western Union Telegraph Company.

POST AND FIRE-CONTROL TELEPHONE SYSTEMS.

Capt. Le Roy S. Lyon, Artillery Corps, acting signal officer, Department of the East, in his report strongly recommends a standard equipment of all posts with telephones and switch boards to be installed under proper supervision in each case by the Signal Corps, and subsequent regular inspection. The slight benefit derived from excellent instruments furnished by the Signal Corps at some posts is due to bad installation in the first place, and lack of care and repairs after telephones are put up. The limited number of Signal Corps men available in the United States has greatly hampered attempts to improve this condition of affairs.

It would appear that at many artillery posts as well, probably through lack of electrician sergeants, the fire-control telephones are in bad condition from the same causes. This causes much dissatisfaction and undeserved criticism of Signal Corps instruments in many cases, furnishing another example of the difficulties introduced by divided responsibility regarding electrical communications at posts.

WIRELESS TELEGRAPHY.

The signal officer, Department of California, in transmitting report of first-class Sergt. Frank E. Peters, Signal Corps, in immediate charge of the wireless telegraph, states that the system has been in uninterrupted use since July, 1900. The stations are at Fort Mason and Alcatraz Island, a distance of nearly 1½ miles, and it appears to give satisfactory service up to 15 words per minute.

The Chief Signal Officer has instituted experiments with a view to extending the wireless service to the Army transport system.

Its use approaching the Pacific coast near San Francisco, where fogs are troublesome and frequent, would be very advantageous.

FIRE-CONTROL CABLES.

During the year the following cables have been laid for fire-control purposes, or contracts let for their manufacture and laying:

Cables.	Size.	Length.
		<i>Miles.</i>
New London Light to Great Gull Island	4-conductor	9.2
Great Gull Island to Plum Island	2-conductor	3.3
Plum Island to Gardners Point	Single-conductor	3.63
Fort Adams to Fort Wetherill	2-conductor	1
Fort St. Philip to Fort Jackson	3-conductor	14,000
Fort Wadsworth to Fort Hamilton	6-conductor	21,900
Narragansett Pier	Single-conductor	22,640

¹ Feet.

² Feet (repair).

Capt. Le Roy S. Lyon, Artillery Corps, signal officer, Department of the East, has reported that owing to frequent breakage cable communication between Fort Wood and Ellis Island, New York Harbor, has been discontinued. Also that the 4,000-foot 8-conductor cable between the barge office and Governors Island, New York Harbor, previously contracted for, has been laid.

Repairs have been made on the cable between Fort Hancock and Fort Wadsworth, and repairs are pending between Forts Delaware and Du Pont.

This officer also makes timely recommendations concerning a careful installation of cable at all artillery posts where fire-control communications exist.

In a circular letter from the Chief Signal Officer of the Army to the various department commanders, dated May 13, 1901, it was requested that requisitions from artillery posts requiring fire-control apparatus be submitted separate from the ordinary requisition for Signal Corps post supplies, together with maps of existing and proposed systems of communication.

The requisitions were in many cases much delayed, and were unsatisfactory bases for ordering the supplies, due to lack of accurate available information as to the character of apparatus and material required.

A Signal Corps portable wall telephone was devised by a board of Signal Corps officers which will no doubt be satisfactory wherever a telephone is necessary in fire-control communications.

No authoritative designs for dial telegraphs having been reported upon, and many requisitions having been made for these instruments, the Chief Signal Officer has, with the approval of the Chief of Artillery, ordered a number of promising experimental forms to be made for issue and test in fire-control installations.

Some of the other special instruments required by regulations to be furnished by the Signal Corps are also in an experimental state, and the Chief Signal Officer has been compelled, in order to fill urgent requisitions, to supply those that seemed best adapted for the purpose.

The Chief Signal Officer has, in accordance with the report of the board of officers at Fort Monroe, approved by the Chief of Artillery, the Lieutenant-General Commanding the Army, and the honorable Secretary of War, dated Aug. 7th, 1901, proceeded to procure a complete equipment of cables and instruments for the communications and electrical devices required in a fire-control system at that important post.

The division of the electrical installation at posts among the different corps has required numerous personal consultations and introduced many of the difficulties noted in previous reports, and any progress has been made only by mutual concessions.

The cooperation and active interest of the Chief of Artillery has made it possible to accomplish much that would have been otherwise impossible. By personal interviews with him the details of apparatus have been arranged, where the absence of specifications and tentative character of the fire-control-communication systems at posts would have made the selection of proper instruments very difficult otherwise.

The current appropriation of \$35,000 for fire-control communications will provide for only the partial equipment of a few posts. The complete equipment will require a much greater amount. In view of the rapid completion of emplacements and range and position finder towers, the demands on the Signal Corps will be large. A corresponding liberality in appropriations is urged.

Very respectfully,

EDGAR RUSSEL,
Captain, Signal Corps.

APPENDIX No. 2.

REPORT OF MAJ. JOSEPH E. MAXFIELD, SIGNAL CORPS, COMMANDING SIGNAL CORPS POST, FORT MYER, VA.

SIGNAL CORPS POST,
Fort Myer, Va., September 28, 1901.

SIR: I have the honor to make the following report upon work at the Signal Corps Post during the year ending June 30, 1901:

NEW BUILDINGS.

The following buildings have been completed during the year: Administration building, January 24; balloon house, for the protection of inflated balloons, February 1; a small temporary storehouse, June 3.

The administration building is sufficiently large to give, in addition to the necessary offices, a large room used as a lecture and recitation room for enlisted men, a photographic room with a dark room, and a small room used as a recitation room for officers.

In the basement of the annex to the administration building has been mounted a 50-horsepower oil engine and dynamo sufficiently large to light the post by electricity should this seem desirable. The upper floor of the annex is utilized as a machine shop.

Owing to the fact that the site of the post is covered by a dense growth of trees

and brush and is very uneven, the balloon house can not be utilized for the purposes for which it was built until a large space in front of it is cleared, drained, and graded. Plans for this work have been drawn and will be submitted. The clearing and grading of this ground is also advisable in order to give sufficient space for the drilling of the command. At present there is no space at the post where even 30 men can be properly drilled at one time.

INSTRUCTION.

One of the objects for which this post was established was understood to be to give the necessary instruction to recruits and other enlisted men in the Signal Corps before they were put upon duty in the field or at posts. During the year 258 enlisted men have received instruction at this post. Of these, 80 were on duty at the post June 30, 1900, and 178 were received either by enlistment or from organizations serving abroad. During the year, 127 men have been sent from this post for duty abroad and 40 men for duty in the United States; 34 men have been discharged at the post, and 1 died during the year; 5 men deserted. The average length of time that men have remained at the post after reporting here has been two and one-third months. On account of this short period of stay and also the uncertainty as to the length of service of any man at the post, arising from the constant drafts upon the force here for service in the Philippine Islands and Alaska, it has been impracticable to formulate a hard-and-fast system of instruction. All men, however, have been instructed according to their needs in telegraphy, signalling, telephony, and the use of instruments employed in Signal Corps work.

Until the middle of May the number of officers on duty at the post was so small that no systematized course of instruction for officers was possible. While at times more officers were temporarily on duty at the post than were necessary for administration, these were known to be under orders which would limit their stay at the post to a few weeks or days. After May 15 a course of instruction for officers was instituted embracing instruction in Army Regulations, customs of the service, military law, electricity, telephony, photography, and other subjects connected with Signal Corps work. This course was continued until the end of the year.

THE POST AS A DEPOT FOR SUPPLIES.

During the year a large amount of Signal Corps supplies and material not needed in Porto Rico, Cuba, the Philippine Islands, and posts in the United States has been shipped to this post. Much of this material, particularly instruments, has been received in an unserviceable condition. These instruments, especially telephones and telegraph instruments, have been put in a thorough state of repair and made ready for reissue.

The storehouse available has been insufficient for the proper storage of all supplies received, but by the utilization of buildings designed for other purposes loss has been avoided. At the end of the year a large part of the material and supplies received here had been reissued. Since the close of the year the property pertaining to the Signal Corps depot in the city of Washington has been removed to the post and it has since been practically the sole depot for storage and issue of Signal Corps supplies. To enable this additional work to be carried out in the best manner possible the building of an additional storehouse of the size of that already at the post is recommended.

MILITARY TELEGRAPH AND TELEPHONE LINES.

The following telegraph and telephone lines have been maintained and kept in a state of repair during the year:

- A. Lines pertaining to the local administration of the post of Fort Myer, Va., and the Signal Corps post, Fort Myer.
- B. A line connecting with the Western Union Telegraph system in the city of Washington.
- C. A line connecting with the Postal Telegraph system in the city of Washington.
- D. Two telephone lines between the post and the city of Washington.
- E. Telephone line from Fort Washington and Fort Hunt via Fort Myer to the city of Washington.

PHOTOGRAPHIC WORK.

During the year a photographic room, fully fitted with the proper appliances, has been established and a large amount of work in this line connected with the various departments of the Army performed. Among other work was that of making a large number of photographic copies and enlargements for display at the Pan-American Exposition at Buffalo, N. Y.

AUTOMOBILES.

During the year experiments have been made with the view of determining the value of automobiles in the military service, more particularly in the work of the Signal Corps. Two types of electric automobiles have been thoroughly tested during the year and the conclusion arrived at that they are not adapted to military use. Bids have been invited for the furnishing of one steam automobile and two operated by explosive engines using gasoline as the motive power. Upon their arrival further tests are contemplated which will enable a satisfactory conclusion as the utility of these vehicles.

PERSONNEL.

Capt. G. W. S. Stevens, Signal Corps, United States Volunteers, was in command of the post from the beginning of the year until October 1, when the command was assumed by Maj. J. E. Maxfield, Signal Corps, United States Army, who remained in charge to the end of the year.

The names of all officers serving at the post, together with dates of their service, is shown in Appendix A.

RECOMMENDATIONS.

In making recommendations as to the needs of the post in the future absence of knowledge as to what it is wished to make of the post renders full and intelligent recommendations impossible. If the post is to be maintained as a Signal Corps depot for supplies, an additional storehouse, as already recommended, is believed to be necessary.

If, further, the post is to be maintained as a school of instruction for officers and enlisted men it is believed that the following buildings are urgently needed:

1. A guardhouse.
2. Quarters for at least six noncommissioned officers.
3. A stable which will accommodate at least 14 public animals and 6 private horses owned by officers.
4. At least one double set of officers' quarters.

All of these buildings have been recommended during the last two years by the inspectors who have made the annual inspection of the post.

If the post is to be maintained as a school of instruction, it is further recommended that definite course of instruction be decided upon covering not less than four months for enlisted men and not less than six months for officers, and that officers and men sent here be ordered with the understanding that they are to remain at least during these lengths of time.

Very respectfully,

J. E. MAXFIELD,
Major, Signal Corps, U. S. A., Commanding Post.

APPENDIX A.

Officers at Signal Corps post, Fort Myer, Va., since June 30, 1900.

Rank and name.	Joined—	Left post—
Capt. G. W. S. Stevens	Dec. 17, 1898	Nov. 9, 1900
Capt. Carl F. Hartmann	May 17, 1900	Oct. 25, 1900
First Lieut. Charles B. Rogan	Aug. 24, 1900	Sept. 6, 1900
Capt. Edward B. Ives	Sept. 11, 1900	Sept. 19, 1900
First Lieut. William O. Bailey	Sept. 24, 1900	May 5, 1901
Maj. J. E. Maxfield	Oct. 2, 1900	(1)
Capt. Daniel J. Carr	Feb. 13, 1901	Feb. 20, 1901
First Lieut. John J. Ryan	Feb. 23, 1901	Apr. 17, 1901
First Lieut. William Mitchell	Apr. 16, 1901	Aug. 5, 1901
Capt. Otto A. Nesmith	May 1, 1901	May 16, 1901
First Lieut. Charles DeF. Chandler	May 3, 1901	Aug. 20, 1901
First Lieut. M. K. Cunningham	Oct. 5, 1900	(1)
Capt. C. McK. Saltzman	May 16, 1901	(1)

¹ At post.

APPENDIX No. 3.

REPORT OF CAPT. FRANK GREENE, SIGNAL CORPS, CHIEF SIGNAL OFFICER, DEPARTMENT OF ALASKA, ON OPERATIONS OF SIGNAL CORPS IN ALASKA.

HEADQUARTERS DEPARTMENT OF ALASKA,
OFFICE OF THE SIGNAL OFFICER,
Fort St. Michael, Alaska, August 12, 1901.

SIR: The duty of the Signal Corps in this department in the year ending June 30, 1901, was confined to the construction of military telegraph lines and the operation of such sections as were completed.

The following-named sections were built by detachments averaging 25 men each, under the command of the officers or noncommissioned officers named:

Officer in charge.	Sections built.	Distance.
		<i>Miles.</i>
First Lieut. G. W. Stuart, Seventh Infantry.....	Nome to Fort Davis and Port Safety ..	24
Second Lieut. W. O. Smith, Seventh Infantry.....	St. Michael and Golsovia	35
First Class Sergt. C. Wahl, Signal Corps	Golsovia to Unalaklik	30
First Lieut. R. S. Offley, Seventh Infantry.....	Unalaklik to Twenty-two-mile Cabin ..	22
First Lieut. O. B. Grimm, signal officer, United States Volunteers.....	Twenty-two-mile Cabin on Kaltag portage to Nulato.....	108
Second Lieut. W. O. Smith, Seventh Infantry	Nulato eastward	13
	Fort Gibbon to Old Station west.....	13
Two detachments, one commanded by Second Lieut. P. M. Cochran, Seventh Infantry, and another by Second Lieut. J. M. Loud, Seventh Infantry.....	Scattered short lengths between Old Station and Kokrine's aggregating, approximately, poles and wire. And of poles alone, no wire being strung.....	11
Second Lieut. W. M. Craigie, Seventh Infantry.....	Fort Egbert to international boundary.....	19
First Lieut. G. C. Burnell, signal officer, United States Volunteers.....	Fort Valdez to Station No. 3.....	11
Do	And poles set to Ernestine Creek.....	37
	Total	13
		336

In addition, the Valdez line has been extended some miles farther north, and a detachment from Fort Egbert has cleared a trail and cut poles for a distance of approximately 60 miles in a southwesterly direction toward the head of Mosquito Creek, with a view to meeting the Valdez line near the crossing of Tanana River at Tetling. On account of the infrequency of mail communication with these parties definite report can not be made.

In the performance of the duty named the detachments were subjected to many trying hardships and some peril, all of which, generally speaking, was borne with fortitude. Most of the work was done well, but the experience derived is that for the proper conduct of construction of military telegraph lines on a large scale and under trying conditions the most satisfactory work will be done by signal officers whose peculiar duty it is.

Great delay, hardship, and heavy expense were caused by the stupid action of the master of the army transport *Katie Hemrich*, who, about October 1, 1900, on his way down the Yukon River with orders to move a detachment from above Nulato to Kaltag, refused to receive the detachment aboard and steamed away, leaving the detachment standing on the river bank.

(NOTE.—The Chief Signal Officer is informed by the Quartermaster's Department that there is no such transport in the service of the Government.)

This delayed the work over the Kaltag portage, and put two detachments in such straits afterwards that grave fears were entertained for their safety. Material was abandoned, and the men were forced to break trail by marching in columns of fours through miles of snow over waist deep to extricate themselves from beleaguement.

The following sections are in operation, viz:

	<i>Miles.</i>
Nome to Port Safety.....	24
St. Michael to Nulato.....	195
Fort Egbert to international boundary	11
Port Valdez to station No. 3.....	37
Total	287

On June 30 there were in the field detachments of 30 men near the mouth of the Koyukuk River, commanded by First Lieut. O. B. Grimm, signal officer, United States Volunteers; 25 men near Kokrines, commanded by Second Lieut. J. M. Loud, Seventh Infantry; 25 men 30 miles west of Fort Gibbon, under command of Second Lieut. P. M. Cochran, Seventh Infantry; 37 men north of Port Valdez, under command of Capt. G. C. Burnell, Signal Corps, United States Army; 40 men southwest of Fort Egbert, under command of the first sergeant of Company E, Seventh Infantry.

A route has been explored by Mr. William Yanert, superintendent of construction, from Rampart City to a point near the head of Beaver Creek, and found feasible for constructing a telegraph line, being well timbered and fairly dry. He will continue the exploration this autumn and endeavor to make connection with the Abercrombie trail and telegraph line on the headwaters of Forty Mile, where the trail strikes for Tetling, on the Tanana.

There is abundant material on the ground for the construction and operation of the whole line as originally intended.

Cable communication between Forts St. Michael and Davis has not yet been accomplished, on account of the wrecking of the steamer containing the cable and the litigation that followed. The salvor laid and operated the cable for a very few weeks in October and November, 1900, when it was practically destroyed by the ice, and communication has not yet been restored.

I fear that the cable is not worth the cost of repairing. Fortunately it has not yet been accepted by the United States.

The seasons have seemed to conspire against telegraph construction, the ground being almost impassably boggy in the fall, the cold intense (-72° F.) in the winter, the snow soft and deep in the spring, and now in the summer hordes of appallingly ferocious mosquitoes drive the men of the working parties to the verge of insanity.

Very creditable work was done by Capt. G. C. Burnell, Signal Corps, United States Army, on the Valdez section.

This officer with a small detachment vigorously pursued the work of construction over a rugged mountain trail, and when, on account of the depth of snow, construction work was impracticable he continued the work of pushing forward his material in sleds over the summit of the mountains that spring work might not be delayed.

That so much of the line is now in operation from St. Michael northward is due to the personal energy and indomitable spirit of First Lieut. O. B. Grimm, Signal Corps, United States Army, who continued in the field all winter.

Many superficial frostbites were sustained and one life lost, that of Private Joseph Watson, Company I, Seventh Infantry, who was killed by a snow slide at the Old Woman's Mountain on April 2, 1901.

The short section from Fort Egbert to the international boundary, connecting directly with the Dominion telegraph line to Dawson, thence to Skagway, gave the post of Fort Egbert telegraphic communication with Washington, D. C., thirty days shorter than telegraph to Seattle and mail thence via Skagway and Dawson, shortened telegraphic communication to all points in western Alaska an equal period, and was of convenience to persons upon the Upper Yukon River. No marked military or public benefit traceable to the lines is known.

Since the date of completion of the line, May 5, 1901, no interruption has occurred.

Number and kind of battery cells in use.

Nome, Alaska, Callaud	37
St. Michael, Alaska, Eagle	39
Nulato, Alaska, Eagle	38
Egbert, Alaska, Callaud	25
Valdez, Alaska	Unknown.

Telegraph business.

Cash receipts, "this line"	\$510. 52
Cash receipts, "other line"	\$1, 100. 39
Value free messages sent	\$1, 229. 60
Commercial messages sent	927
Commercial messages received	771
Free messages sent	1, 537
Free messages received	1, 566
Total handled	4, 801

I am, very respectfully,

FRANK GREENE,
Captain, Signal Corps, U. S. A.

RAMPART, ALASKA, May 10, 1901.

SIR: I have the honor to inform you that I have completed certain tours of exploration by direction of Lieut. H. Erickson, Seventh Infantry, which work is a part of the labors performed by the exploring expedition of which he has command, and to submit report and map covering the section of country investigated by myself, this in compliance with instructions contained in your letter dated at St. Michael, Alaska, August 29, 1900.

I remained with Lieutenant Erickson until February 21, on which date he detached me from himself with instructions contained in Special Orders No. 1, dated Camp on Beaver, February 21, 1901, copy of which I inclose.

I entered upon the execution of the work outlined therein on the day following, and began by exploring the flat country which borders upon the Yukon to the south and extends between Fort Hamlin and the mouth of the Beaver. I afterwards investigated the upland which extends eastward from Fort Hamlin towards the headwaters of the Beaver; also the valley of Mike Hess Creek and the country to the south of this stream as far as Big Manook Creek. After this I proceeded down the Yukon to investigate the Ramparts.

I investigated all parts of the country thoroughly and am able to point out the best routes by which it should be traversed with respect to directness, easy grade, proximity to wood and water, etc., but the great depth of snow, especially in lowland and creek bottom, prevented me from acquiring an accurate knowledge of the ground surface in such places. I, however, feel satisfied that the routes I shall describe are entirely feasible and the best that this section affords, since fairly accurate deductions may be made from what is visible above the snow.

The higher country lying between Rampart City and Mike Hess Creek is easily traversed. It consists of ridges which branch out from the head of 47 Pup (tributary of Hunter Creek) and Willow Creek (tributary of Troublesome Creek), land running parallel to the various creeks, and extend to points near the Yukon. The highest points of these ridges reach slightly above the limit of timber. The footing is generally good. High levels should here be avoided, as they are apt to be soft. The lowlands along the Yukon are swampy, and entirely unfit for travel during the summer season.

Mike Hess Creek has an exceedingly swampy valley, whose average width is about 1 mile. There are only two points known to me on this stream where its banks may be approached on hard ground and where fording is probably possible during all stages of water. The lower one of these points is about 4 miles above the mouth of Troublesome Creek, the upper about one mile above the mouth of Fish Creek. The width of the creek at the lower crossing (high water) is 195 feet, at the upper one 147 feet, but at either crossing the north bank, being low, shows signs of occasional flooding, at such time greater width than given above would obtain. The tortuous course of this stream would indicate slow current.

The country north of Mike Hess differs from that to its south in that it is mountainous and in places badly cut up by ravines and gulches. Especially is this the case in close proximity to the Yukon. Farther east it becomes moderately rough, and at the head of Mike Hess it assumes the nature of a basin. This basin is bordered to the east and south by a high and rough mountain chain, the south slope of which is undoubtedly drained by the tributaries of the Tanana. The north limit of the mountain country to the north of Mike Hess Creek is quite well defined by a rather abrupt slope. The divide of this system may be reached at the head of Hamlin Creek. From there it extends eastward, is crooked near the Yukon, but becomes fairly direct less than a day's travel out of Fort Hamlin. From this divide any particular point in this section can be reached. The footing nearly everywhere is good.

The Yukon flats begin at a point about 2 miles above Fort Hamlin. It has been supposed that they were quite wide; that they covered the entire area between the Yukon and the mountains just described. This is an error, as the flats between Fort Hamlin and the mouth of the Beaver are at no point wider than about 16 miles. A well-defined bench, which in some places assumes the appearance of low, rolling, hill country and is quite flat in others, skirts these mountains all along. This bench has an abrupt break into the marshy, flat land at its foot, and varies there from 15 to 200 feet in elevation. It touches the Yukon at several points above Fort Hamlin, the last of these points being about 25 miles up river. Thence it trends away from the river, gradually gaining the distance mentioned. This bench land is entirely timber covered, and numerous small streams, coming from the north slope of the mountains, find their way through it to the Yukon. Its surface is variable, but near the immediate foot of the mountains, where the slope is more pronounced, the ground is hard, and a very direct trail could be established there.

The flats, though easily traveled during the winter, would be quite the opposite in the summer, and I did not pay much attention to them. From the divide they appear to be a network of lakes, ponds, dead channels of the Yukon, and tundra.

As for the routes by which the above-described country is accessible, and over which, in my opinion, a telegraph line and trail are quite possible, I would point out the following:

Rampart City to Hunter Creek, up Hunter Creek to mouth of 47 Pup, up 47 Pup to the divide at its head; thence to head of McDermott Creek via the divide; thence across middle portion of Lynx and Raven creeks to point on Troublesome Creek where that stream emerges into the valley of Mike Hess Creek; thence across Troublesome Creek to the lower crossing on Mike Hess; thence to the head of Rogers Creek; thence across Waldron Creek and down Hamlin Creek to Fort Hamlin.

From Fort Hamlin, if proximity to the Yukon is desired, up Hamlin Creek to its head; thence across Waldron Creek, or around its head on the divide, to foot of Mount Randall; thence on the divide to head of Fox Creek, down Fox Creek and across the bench land to point on Beaver.

The divide at the head of Fox Creek may be reached from Rampart City by taking the afore-mentioned route as far as the divide at the head of 47 Pup; thence down Willow Creek about 4 miles; thence along foot of hills on north side of both Willow and Troublesome creeks about 3 miles; thence across Troublesome Creek and eastward about 9 miles; thence north and across Richardson Creek to the upper crossing on Mike Hess Creek; thence up the valley of Fish Creek to the divide skirting the foot of the hills north of Fish Creek.

The headwaters of Mike Hess Creek and points to the east of them are easiest reached from Rampart by following this route to the point where it turns north between Troublesome and Richardson creeks, thence by continuing in an easterly direction as indicated on map. I believe that this line could be successfully extended eastward around the head of the K'tauk-ah-nu to the head of the Beaver, thence across Birch Creek to connect with the line being built from Valdez.

I also investigated the route from Rampart to Hamlin on which Lieutenant Erickson probably reported during October of the past year and which ran from Rampart via Chicago, via lower Mike Hess, via Indian Pass, via Waldron Creek to Hamlin. This route I found to be quite impracticable.

Concerning means for crossing the more important streams in this section, I am of the opinion that wire-rope ferries, with floats constructed on the grounds, would serve all purposes during high-water stages, fords during ordinary water, and the ice during the winter. The width of Mike Hess has already been mentioned. Troublesome creek measured at its mouth is 120 feet wide. Big Manook, where it joins the Yukon, measures 245 feet, it, however, only carries or contains such volume of water when the Yukon is flooding. It may be rounded at the mouth on a gravel bar or forded at other points during low water.

Were it not for the fact that the Yukon does at times badly affect the mouth of this stream a line could be carried to the head of 47 Pup by way of the spur which terminates at the mouth of Julia Creek.

None of the other streams shown on the map are of any consequence, Beaver Creek excepted. It is wider than Dall River and was navigated in 1898 with a small stern-wheel boat.

Timber for bridging or for other purposes that may be decided upon exists on the grounds, house logs are obtainable on any of the larger streams, as are also trees that would serve as telegraph poles. If lowland routes are decided upon no trouble will arise from this source, but to the divides timber and poles will have to be hauled.

As for the selection of routes I would say that through this region the divides should be avoided. I found that there were many days during the past winter on which travel on the divide was impossible. A gale from the north, gathering force in its course across the flats which are more extensive north of the Yukon, breaks on the divide, which, on account of its direction, is exposed to it. The snow for this reason was well packed, but it had by these winds been cut into innumerable sharp ridges running north and south, and this rendered progress slow and difficult. A trail there would be erased in a few hours, whereas one in the low-timbered land is traceable and good for the winter. I also noticed that the trees on some of the higher points were completely ice-clad, so that not even a needle was to be seen on them. This was most likely brought about by a rain that fell during the early part of February; similar conditions would undoubtedly prove fatal to any suspended wire.

I ascertained the width of the Yukon directly opposite the flagstaff of Camp Rampart City and found it to be 2,020 feet; I also sounded on this line and obtained depths ranging from 29 to 34 feet, current about 5 miles. Both banks at this point are low, offering no natural height that might serve as an elevation for a wire. I

also measured the Yukon at various points at the ramparts, 32 miles below Rampart City. I found that the narrowest and best suited place is about 300 yards below the lower point of the rock bar or Rock Island. Here the width is only 1,586 feet, both banks are high and rocky, having an angle of from 30 to 40 inches. Measured across the center of the island the width is 2,150 feet—i. e., south channel 625 feet, bar 925 feet, north channel 600 feet. I believe that a permanent support could be erected on this bar (the term island should not be applied to it as it is entirely under water during the flooding season), it is strewn with many large boulders which could be used to ward off the ice when it first begins to move, at which time the water is too low to endanger a structure on the highest rocks there. I believe that when the water finally does attain such volume all danger from ice has passed, though some still exists from driftwood. All the measurements herein given were made with a tape resting on the ice, deductions must therefore be made for sag and uneven surface.

Horses and mules could be advantageously used during the summer in all sections of the country described.

I am, sir, very respectfully, your obedient servant,

WILLIAM YANERT,

Civilian Employee, Signal Department, U. S. A.

Maj. FRANK GREENE, U. S. V.,

Chief Signal Officer Department of Alaska, Fort St. Michael, Alaska.

APPENDIX No. 4.

EXTRACTS FROM REPORT OF CAPT. GEORGE C. BURNELL, SIGNAL CORPS, IN CHARGE OF TELEGRAPHIC CONSTRUCTION ALONG THE TRANS-ALASKAN MILITARY ROAD.

AUGUST 4, 1900.

I left Seattle, Wash., on board the steamship *Excelsior* with a detachment of 14 men of Company D, Signal Corps, on June 30, 1900, in compliance with letter from the signal officer, Department of Alaska, dated Seattle, Wash., June 29, 1900; arrived off Port Valdez, Alaska, on the night of July 8 and landed on the night of July 9, 1900.

It was found upon arrival that the streams between Port Valdez and Station No. 1, on the Trans-Alaskan military road, and between the military post of Port Valdez and Station No. 1 were so high and the currents so swift that it would be impracticable to transport property to Station No. 1 by land.

The line material and other property were loaded on lighters on the 10th and 11th days of July and taken by steam launch to within 1 or 1½ miles of that point.

Four men were detailed to unload by small boats, but as they could work for a few hours each day only, during high tide, four additional men were sent to assist. These men have their camp at Station No. 1. Owing to the distance of the lighters from the station, the want of experienced boatmen in my detachment, and to the fact that the work could be carried on only during a few hours each day at high tide, the work of unloading was so slow that it was deemed advisable to employ experienced boatmen. Nine civilians and one boat were hired on the nights of the 13th, 14th, 16th, and 17th days of July, for the work could most advantageously be performed during the night at highest tide.

Boats with even a light load had to be towed up and across streams, the stores had to be landed on sand bars and carried by hand to the station, a distance of more than half a mile, the wire remaining until the last. The work was completed on the 22d.

Then the eight men at Station No. 1 began the work of line construction toward the military post as far as Lowe River, for a distance of 1½ miles, and toward Port Valdez, a distance of 2½ miles. On the latter section all the poles but nine were up, but the work was slow on both sections, owing to the great number of deep and rapid streams and to the quicksands over which the line had to be built.

The men not engaged in unloading lighters commenced on the 12th on the construction of the telegraph line. On the same date 12 men of Company G, Seventh Infantry were ordered to report to me and assist in the work.

The country over which this line was built from the post to Lowe River was very rough, rocky, and covered with a dense growth of underbrush. This and the fact that for considerable time the men had to wait for low tide to go to and from their work, with the exception of a few days when the launch took them, made the progress very slow. In many places hours of work were completely lost by digging holes which could not be used, not being deep enough for poles, since the rocky condition of the soil prevented successful work without considerable blasting. Then it became

necessary to trim trees and cut the tops off and use them as poles, because of the more solid setting. The pack train was used for distributing supplies along the line after the mules had been shod and the aparejos set up. After leaving the bluffs the difficulties, though changed, were not lessened, as then it became necessary to run the line over several streams and across quicksands. On July 30, during eighteen working days, all the line material and property had been landed and stored at Station No. 1, 8 miles of line completed, and instruments put in at the military post and at Port Valdez, but there remained a small stretch of wire to be put up to connect with Station No. 1.

SEPTEMBER 3, 1900.

On August 1 eight men camped at Station No. 1, trans-Alaskan Military road, continued work from that station toward Station No. 2. The remainder of the detachment was held in readiness at Port Valdez to move to No. 1 on the afternoon high tide, but owing to the roughness of the bay did not leave until next high tide, about 3.15 a. m. August 2. The entire detachment was employed during that day in landing camp equipage, bedding, and rations for the month, which, due to the swiftness of the streams, up and across which the small boats had to be pulled, was accomplished only by tying wire to these and letting them down stream from one-quarter to 1 mile, then pulling them up to a sandbar, each wire manned by eight men or more. Afterwards the stores were taken to the station by pack mules. On the 3d the work of line construction was resumed and batteries put in at Station No. 1, and on the following day telegraphic communication was established between Port Valdez and Valdez via Station No. 1.

The total of actual work on the lines performed during the month is thus summarized:

The gap over Lowe River between Port Valdez and Station No. 1 was filled out and telegraphic communication established, via Station No. 1, between Port Valdez and Valdez. Between No. 1 and the summit 335 holes were dug and poles set, 40 of which had to be cut, 30 trees were trimmed and topped, the wire was put up to within a few poles of the summit, and 72 holes beyond the summit were prepared. In addition to this 3 poles had to be reset on the section between No. 1 and Valdez, where the glacier stream, by changing its bed, had washed them out.

OCTOBER 3, 1900.

From the summit to station No. 3, 179 poles were set; 138 poles and 8 dismembered trees were already in place. The poles set in this section were found cut and piled not far from timber line and about 6 miles from the summit. They were hauled and distributed over that distance by the use of mules. The employment of mules for this purpose, and the necessity of leaving four mules at Valdez to move Signal Corps property, brought by the *Willamette*, from the lighters to temporary shelter, reduced my pack train to a considerable extent. It therefore became necessary to move forward before the wire and other line material could be brought up. On September 6 camp was moved 3 miles beyond No. 3, and the work of putting up poles ready for the wire was continued. On the 14th the material for the line for No. 3 having arrived, a party was sent back to put up the wire, and on the 17th communication between stations 3 and 1 was established. On the section from No. 3 to the crossing of the South Fork at Teikell River, 53 poles and 76 trees were prepared. In the meantime camp was removed to the relief cabin and work continued to Stewart Creek, the pack train returning for more material. One hundred ninety-five poles and 106 trees were prepared in the section, bringing the line of poles to Stewart Creek and over the coast divide. It was found necessary to do considerable blasting over Stewart Creek divide, as the country is very rocky. More material having been brought up on the 23d, the wire was put up on September 24 and 25 to a point 4 miles north of station No. 3, and the detachment started back to Port Valdez. During the month 427 poles were put up, 248 of which were cut by the detachment, and 182 trees were trimmed and topped; 138 poles and 8 trees were found already up. Fifteen miles of wire was put up. There is now in operation 41 miles of line, and the line is up beyond the last station for a distance of 4 miles. The line of poles is continued to a distance of 8 miles beyond the wire. Five stations are in operation, one at Port Valdez, one at Valdez, one each at stations Nos. 1, 2, and 3, trans-Alaskan military road. Work on the line might have been continued for two or three weeks longer, and animals still have been able to return over the summit were it not that the frost had destroyed the feed for them and made it necessary to employ about one-third of the pack train for packing grain each trip, thus leaving but few mules available for rations and line material. It was deemed advisable to bring the detachment in to put up a telephone line between the posts and Valdez, and to build a storeroom at No. 2, where property could be stored preparatory to its

being sent farther in on sleds, and in the meantime to employ the animals in moving forward to No. 2 all the line material possible which can be done by wagon during a part of October and November.

DECEMBER 1, 1900.

The condition of the weather prevented the further progress of work on the telegraph line during the greater part of the month. The repairman's cabin under construction at Dutch Flat at the beginning of the month was completed and the men returned to the post.

Poles were cut and the way cleared from station No. 4 (Government stables) to Ernestine Creek, when the men engaged in that work were ordered to return, as the work could not be advantageously carried on, owing to snow and cold weather.

The work of building a temporary stable for the pack animals began on the 7th, the stable being now nearly completed. The packers and pack animals have been engaged during the greater part of the time in getting out logs and timber for the construction and taking line material to station No. 2.

FEBRUARY 8, 1901.

Due to the season, sledding was the principal work done during the month of January. All the line material on hand is now at station No. 2, including 200 iron poles to be used on both sides of the summit to replace such poles (wooden) as have already been or will be broken or carried away by snow slides.

The men of the detachment have mostly been employed in repacking material and supplies in such shape as makes transportation by pack train practicable. Their health has throughout been good.

MARCH 2, 1901.

The Signal Corps property now over the summit comprises 307 coils of wire, about 7,000 brackets, 127 boxes insulators, and several minor articles. It was impossible to transport the insulators in bulk as received here.

APRIL 9, 1901.

In order to push forward the material and supplies as fast as possible eight horse sleds were hired for two weeks, at a flat rate of \$25, with the option of purchasing them at the expiration of that time, should they be required, at market price less the amount paid for rental. It was hoped in the meantime the sleds asked for would be received, but as they were not, it was thought for the best interest of the service to purchase these sleds in order to get the material as far as possible before the sledding season ends.

All the material reported as being over the summit in my last report, together with 20 of the 25 crates of brackets which were then being brought up from station No. 2, has been moved to Stuart Creek.

On March 25 I availed myself of an opportunity to go over a portion of the ground over which the line will be constructed with a view of deciding as to the advisability of putting the line over Kimball Pass, where poles will have to be hauled some distance, or going around by the South Fork, where timber is more plentiful, but the distance greater, and also to inspect the line over the summit, noting effect of the heavy snow.

MAY 8, 1901.

Nearly all the line material and supplies were brought up to a point 5 miles north of station No. 4, where a cache was made. Owing to the depth of the snow over Kimball Pass and the absence of sufficient crust to be of any value, it would not be practicable to take the material any farther on sleds this summer.

On April 27 I left Fort Liscum with my detachment with two Hospital Corps men, three Signal Corps men, and eight men from Company G, Seventh Infantry, arriving at station No. 4 May 5. The trail was then so soft that it was not possible to use animals beyond station No. 2. It was therefore necessary for the men to sled in their rations and bedding by hand. After starting over the summit (Thompson Pass) there came up a heavy snowstorm, which made it extremely difficult and uncomfortable traveling. We finally reached station No. 3 at 10.30 p. m., having covered a distance of 10 miles in thirteen hours and forty-five minutes. A number of the men became snow-blind, which necessitated stopping one day at station No. 3.

JULY 3, 1901.

The sledding in of material and supplies was practically discontinued about May 4. The line material, as stated in my last report, being cached 5 miles north of station No. 4.

In order to cover as much distance as possible while waiting until such time as the pack train could be brought in, and as it would not be advisable to depend on using sleds to move camp, the snow being too soft and deep, a detachment was sent to a point 5 miles north of Stewart Creek (the end of the line).

The work of line construction was somewhat slow, as it became necessary to take advantage of conditions and work whenever it was practicable, at different points along the line, as the snow disappeared. Although poles had been cut for this section, to expedite the work trees were topped and used in places where the snow was very deep and would be late in going off. The following work was done during the month: A small log shelter, roofed with tar paper, was put up at Stewart Creek to be used as a temporary shelter by repairmen in winter. A floor was put in station No. 4, the lumber having been whipsawed by the detachment, and the roof was repaired by being covered with the paper and dirt. A log storehouse was built at station No. 5. Four hundred and fifty-seven trees were trimmed and topped, 290 poles were set, and 17½ miles of wire was put up, bringing the north end of the line to Ernestine Creek. In order to continue the work it became necessary to move camp, and as the pack train had not yet been able to get over Thompson Pass, the camp at station No. 4 was moved, May 30, to Ernestine Creek with sleds over bare ground. On May 9 my pack train was increased by the arrival at Valdez of 29 pack mules and two bell mares.

JULY 22, 1901.

On June 1st one detachment was employed getting out poles and cutting right of way from their camp 7 miles north of Tonsina; another was camped at Ernestine, from which point the work at line construction was continued as rapidly as the disappearing snow on Kimball Pass would permit. At a point about 3 miles from camp it was found necessary to begin hauling poles for the south side of Kimball Pass. Three miles of poles were hauled from this point northward, employing four of the animals which had been used for sledding for this purpose. The hard digging, as the ground was still frozen, together with the time consumed hauling poles, made the work progress somewhat slowly; however, there was no time lost, as the camp could not be moved before the arrival of the pack train.

On the 14th one-half the pack train arrived, and the camp was then moved 2 miles north of the summit of Kimball Pass. Poles for the north side of Kimball Pass were hauled from this point, a distance of about 2 miles. From this point more satisfactory progress was made. The following work was done during the month: One hundred and eighty-six trees were trimmed and topped, 404 poles were set, and 16 miles of wire was put up, bringing the north end of the line nearly to Tonsina. On the 19th it was discovered that a forest fire was raging in the valley south of Ernestine not far from the location of my cache, and as that section is covered with a thick growth of spruce timber I became anxious for the safety of the cache should the wind shift and direct the course of the fire to the northward. I therefore proceeded to the cache and burned around it and had the brackets, boxes of insulators, etc., moved to a gravel bank and partially covered with dirt for protection. The precaution was taken none too soon, as four days later, although the property was in a clear space and a considerable distance from timber, when the fire reached that locality three men were employed constantly for several hours carrying water, shoveling dirt, and otherwise fighting fire to protect the cache. These fires have swept over large areas along the trail and telegraph line between station No. 3 and Copper Center, and a great deal of trouble will no doubt be caused by fires every season.

AUGUST 16, 1901.

The progress of line construction was somewhat retarded in the beginning of the month of July by fierce forest fires, particularly south of Tonsina. On July 7 the wire was brought up to station No. 5 and an office established. From this point progress was more rapid, and on the 22d the line was completed to Copper Center and on the 31st to the 110-mile post near the Taslina River, where in the meantime the detachment had been removed.

During the month 41 trees were topped and prepared for wire, 197 poles were set, and 32 miles of wire were strung.

This section of the line, with the exception of a few miles, is over a fairly level and considerably open country; in some places, however, considerable trimming and heavy cutting had to be done, and for a few miles the line is through a marshy country, which made it difficult to set poles solidly, but as frost was found within a few inches of the surface it is thought the coming winter season, with the freezing of the earth around the poles, will remedy this defect.

Considerable trouble has occurred through the burned districts along the line by falling trees, which has demonstrated beyond a doubt that it will be necessary to

remove most of the trees within reach of the wire where the fires have occurred. This work will be done at the close of the season, as men could not well be spared for that work at present.

It was not thought advisable to delay work on the line this summer to build a cabin at Copper Center, as it is desired to erect poles as far as possible with a view of putting up the wire during the sledding season, so a cabin was hired for temporary use as an office and storeroom.

I anticipate building cabins at Copper Center, at either the Kulkana or Gacona and at the Chastochena rivers, at the close of the sledding season next year before line work could be carried on advantageously.

APPENDIX No. 5.

REPORT OF MAJ. GEORGE P. SCRIVEN, SIGNAL OFFICER, CHINA RELIEF EXPEDITION, ON OPERATIONS OF THE SIGNAL CORPS IN CHINA.

SIGNAL OFFICE, CHINA RELIEF EXPEDITION,
Tientsin, China, November 7, 1900.

SIR: I have the honor to submit the following report of service of the detachment of the Signal Corps under my command during the China Relief Expedition in its advance from Tientsin to Peking in August, 1900, together with various notes on the telegraph corps of other armies and recommendations regarding our own organization and equipment, suggested by experience in the field, both in China and the Philippine Islands.

Having been ordered July 12, 1900, to proceed from Iloilo, Philippine Islands, to Manila, "thence to Taku, China, reporting upon arrival to the commanding officer of the United States forces for duty," I left Iloilo by the first steamer sailing for Manila, July 17; arrived there July 19; embarked on the freight ship *Wyefield*, which reached Taku, China, August 2, and on August 3 reported in person at Tientsin to Major-General Chaffee, who on July 30 had reached that place and had assumed command of the American forces. By him I was designated chief signal officer of the China Relief Expedition, and had the honor to serve on his staff in the field during the march to Peking.

On August 4, about 3 p. m., the expedition started from Tientsin.

The personnel of the signal detachment in China at this time consisted of 4 officers, viz: Maj. George P. Scriven, First Lieut. H. W. Stamford, who had been relieved as chief signal officer upon my arrival and placed in charge of the construction of the field line, Second Lieut. Peter Bartsch, and Second Lieut. C. O. Hastings, and in addition 19 enlisted men, of whom 10 had come with Lieutenant Stamford and the Ninth Infantry from Manila, 2 from Iloilo, and 7 with Lieutenants Bartsch and Hastings from San Francisco on the transport *Grant*, which arrived off Taku July 29. These 19 men, thrown together without coordination, many of them recruits, new to their officers, duties, and associates, and of whom only 8 were telegraph operators, even of low grade, composed the force that must not only convey from the field news of events in China, but must transmit instructions to the Army and influence military events as well as diplomatic action between the United States and other powers. Mail service was practically nonexistent. That they succeeded in accomplishing this reflects credit upon them and upon the Signal Corps, but the inadequacy of the force and the difficulty with which it was brought together shows the need of a great increase in the enlisted strength of the Signal Corps and of organized telegraph and signal companies sufficiently strong to meet emergency demands in the various parts of the world to which United States troops are now called upon for service.

Material for the construction and operation of 100 miles of telegraph line, omitting poles, had been brought by Lieutenant Stamford from Manila, but so bad was the packing and so rough the usage received under the difficult conditions of loading and unloading at Manila and Taku that much of the material was found useless. Four acetylene lamps, all that were carried, were broken, many battery jars were destroyed, and the more delicate instruments injured; all telephones required repair, as did the field buzzers. Much of this material came in the original packages from the United States, a fact that indicates the need of extraordinary care in packing articles for distant service and, as I think, the additional need of simplification of material and the selection of only strong and serviceable articles.

With the detachment of men from the transport *Grant* came a hundred miles of

line, but no battery material and instruments, an omission that threatened serious difficulty.

On the steamer *Wyfield* additional supplies were brought, but neither from that ship nor from the *Grant* could material be brought to Tientsin in time for the advance. Days, or more often weeks, were required to transport articles from the ships off Taku to Tongku, thence by river or rail to Tientsin. In illustration, I may say that even my personal baggage, left hastily at Tongku, did not overtake me until after I had been some weeks in Peking.

The most serious difficulty, however, now to be encountered was lack of transport. Upon reporting to the commanding general I had requested 5 saddle horses and 1 wagon for use of the field telegraph. The horses were given, but wagons were so few that not one could be spared from the service of ammunition, rations, and hospital stores. The only train available at the start from Tientsin was that brought by Ninth Infantry. As a consequence it was not until the field telegraph had reached the vicinity of Hoshiwu that an army wagon reported for service. I desire here to call attention most emphatically to the necessity for transport wagons attached to the Signal Corps accompanying any expedition. These wagons should be entirely separate from the general transport of the Army, fitted to meet the requirements of the Signal Service—some with flags, heliographs, lanterns, rockets, and the devices for visual signaling; others with telegraph material, batteries, lances when necessary, and supplies for the construction of a reasonable amount of line. These wagons should be packed and ready for the field, put under the control of the chief signal officer of the expedition, and separated entirely from the general transport, to which, as is the case with the ordnance, only extensive and bulky supplies should be turned over for shipment. It is evident that the first necessity of any army advancing into a hostile country is ammunition, rations, then hospital supplies; afterwards telegraph material. Therefore, the Signal Corps, if unprovided with its own train, can not expect to be immediately supplied by the army if transportation is limited, as almost invariably happens in the United States service, and will be unable to keep up with the march. The construction and arrangement of wagons or carts and pack chests suitable for field telegraph and for visual signal trains of the present day is a matter requiring immediate attention, and should be placed under the care of an experienced officer of the corps, by whom a suitable system should be devised.

Owing to the conditions outlined, Lieutenant Stamford had, before my arrival, agreed to cooperate with the English engineers in the construction of a field line to follow the advance of the allied army. This action was approved by the commanding general and by myself; and, as events proved, though attended by drawbacks, was practically the only way in which the line could have been carried on. The English were supplied with light bamboo lances, whereas our own, though brought ashore from the *Grant*, could not be brought up from Tongku in time to be used; and in addition the English had a large force of coolies and Indians and a junk, but were not supplied with certain other necessary material of which we had a supply. The only wheeled transportation possessed by the entire party, however, consisted of Chinese carts, capable of carrying about 200 pounds each, and a number of small pack mules. The bulk of the material was placed aboard the English junk on the Peiho.

Upon the departure of the allied forces from Tientsin, August 4, Maj. George P. Scriven, Second Lieut. C. O. Hastings, and 2 enlisted men, provided with flags, accompanied the staff of Major-General Chaffee; 1 operator was stationed at Tongku, Second Lieut. Peter Bartsch and 3 men were stationed at Tientsin, and with the construction party under Lieutenant Stamford were present 7 signal men, besides Lieutenant Loch, of the Royal engineers, 2 British linemen, 4 native sappers, and an average of 30 or 40 Chinese coolies, who, of course, were only retained by force, though paid later for their services.

The telegraph from Tientsin to Tongku was in operation, and, thanks to the energy, ability, and almost incessant work of Second Lieut. Peter Bartsch and the men under his control, it continued to perform valuable service for several months, though a hastily-constructed field line, built by Lieutenant Stamford under great difficulties.

The country north of Tientsin is flat, often flooded on the right bank of the Peiho, and almost without trees. There is little difficulty in running the telegraph over it, for the roads are fair in summer. The same character of country extends from Tientsin to Peking, but north of Yangtsun is less frequently flooded, contains more groves, and is cultivated to the highest degree.

On August 3, the day before the advance from Tientsin, the field line had been carried by Lieutenant Stamford to the outposts north of the city, and on the evening of August 4 an office was established near General Chaffee's headquarters at Shilko,

where our army camped the first night of the advance. On the morning of the 5th occurred the fight at Pietsang, after which the American forces, who had made a considerable detour to the west, went into camp about a mile and a half from the pontoon bridge across the Peiho at the village proper, and on the evening of that day the construction party reached the bridge with the field line, and communication was established with Tientsin. About 9 miles of wire were laid. Next day the army crossed the Peiho, marched eastward to the railroad embankment, thence north, and engaged the enemy at Yangtsun. The fight continued until about half past 2 of the afternoon, when, all resistance having ceased, the allied armies went into camp in and about the village, and before nightfall the construction party had carried the line to General Chaffee's headquarters, and military messages, as well as those of the press and of individuals, were sent to the fleet off Taku, to be transmitted thence to Chefoo, at that time the terminus of the telegraph system of the world. On that day about 16½ miles of field telegraph were constructed. No other nation had a telegraph line to the troops. Next day, August 7, the dead were buried and the army remained in camp. The following day the wire in rear was cut and two sections, of 50 yards and 400 yards, removed, but whether this was done by friend or enemy was never determined.

On August 8 the army continued its advance north, crossing to the right bank of the Peiho by the pontoon bridge above Yangtsun. The field telegraph traversed the river by the railway bridge and thence followed the main road north for a time but diverged to a seemingly more direct route through the fields to the westward that day. Riding back over the field line, I realized that this was a mistake, due to unavoidable ignorance of the country. It later caused trouble, for the line passed through many Chinese villages where people were hostile, and not only cut the wire but offered resistance to the construction party, as mentioned in the report of Lieutenant Stamford. However, on that night at the camp at Tsaitseun, the wire was up, but the current, owing to interruptions at the rear, would not pass. About 8 miles of wire was run on that day. At this camp, before the arrival of the telegraph, messages in cipher were received by courier from our minister, Mr. Conger, at Peking, from the English and from a private individual, and Lieutenant Hastings was sent back to transmit them to Tientsin. This hazardous duty he accomplished well. On August 9 the march was resumed. The heat was intolerable, but the command pushed on within about 2 miles of Ho Shi Wu.

I had been ordered to the Russian headquarters in the late afternoon, and afterwards sent to find the English general to arrange certain disposition regarding a permanent garrison, and upon my return about midnight found that Lieutenant Stamford had brought the field line into camp. It was cut during the night, but next morning worked through to Tientsin, about 48 miles away. About 17 miles of wire was run on August 9. On August 10 the allied armies moved on. The heat had grown unbearable, and men of the command were thrown into convulsions and even went mad. Two men of the Signal detachment were overcome by the heat, and 2 of the Coolie laborers dropped dead by the way. That night we reached the village of Tsi En Ping, with the advance guard of the allies at Matao. For the first time the telegraph party failed to reach headquarters, though close behind and having laid 17 miles of wire. Next day a halt was made at Matao, and the telegraph reached the town about twenty minutes after the advancing army left it, and from that time on fell behind the army, though reaching Peking about thirty hours after the occupation of the Tartar city. This delay was due largely to a detention at Tungchow, caused by the nonarrival of the junk, loaded with material.

The telegraph service of no other nation was in sight during this march, and none reached Peking within perhaps a week after the fall of the city. Only the Japanese and Russians attempted to follow the troops with the field line. On August 11 the army pushed on, camping that night on the walls of Dshangdshiawan, and next day, August 12, occupied Tungchow. Next day the march was resumed, the column to which I was attached meeting with heavy storm and not arriving until about midnight at the camp, about midway between Tungchow and Peking.

On August 14 Peking was occupied and the legations were relieved, and on August 15 the Chinese were driven back by the Americans from their positions along the highway through the Chin-men into the Imperial City, whose last gate was at the mercy of the American troops. Here the fighting stopped. On the morning of August 14 Lieutenant Hastings was sent back by me with dispatches from the commanding general. He found the field office at Tungchow, about 15 miles away, where the field line had arrived. The dispatches were telegraphed to Tong Ku, sent thence to the fleet off Taku, where a dispatch boat was in readiness to convey them to the cable station at Chefoo, and it is believed that the Americans thus conveyed to the world the first news of the fall of Peking and the rescue of the legations.

The day after the capture of the city the American and English field line reached Peking and the office was established at the American legation.

The work of the little construction party had been enormous and was performed under most trying conditions. In addition to making, as a rule, the same march as the troops in the most intolerable heat, it had worked over the whole distance and at night opened its office. It had followed the army through a hostile country often without guard, and suffered annoyances not only from the enemy but from the transport of the allied armies, which showed a remarkable indifference to the field telegraph. Interruptions were many, and cutting of the line and removal of large amounts of wire a matter of frequent occurrence; whether done by friend or enemy was not always clear.

Upon arrival at Peking the American-English field telegraph, as mentioned in a later report, was for a time the only practical means of communication between the city and the outer world. Military, diplomatic, press, and private messages were sent in English, French, German, and Italian, even Russian and Chinese dispatches were conveyed in cipher. Five hundred and twenty-four messages in less than thirty hours, some of them of great length, went over the little lance line to Tientsin, and, of course, the line broke down. It was not until a permanent system was established, about October 4, that the service approached that of a commercial line.

The following is quoted from the report of Lieutenant Bartsch, then at Tientsin:

"With the advance of the army interruptions like the foregoing became more serious and annoying, for delays meant an accumulation of traffic, which at this time had assumed great proportions, handling as we did messages for all of the allied forces, the Japanese excepted. While the latter and the Russians had also lines constructed with their advancing armies, it appeared that ours, with all its troubles, was the only one which was able to serve and accommodate them all, a fact which certainly was appreciated by all concerned, and many were the complimentary remarks made, by foreign officers and civilians as well, about the able and proficient service which the United States Signal Corps was rendering under such adverse conditions."

In connection with the work of the construction party, I desire to commend most highly the services of Lieutenant Loch, of the English engineers, and to recommend for the brevet of captain First Lieut. H. W. Stamford, United States Volunteer Signal Corps, for meritorious and fearless conduct in the field during the march of the allied armies from Tientsin, August 4 to 14, 1900. I desire also to recommend for a certificate of merit First-Class Sergts. Charles H. Trotter and Thomas P. Akers for meritorious service and gallant conduct in action, and Private John L. Headington for fearless conduct in the field at the battle of Yangtsun. Second Lieut. C. O. Hastings I desire to recommend for the brevet of first lieutenant for meritorious and fearless services at the battle of Yangtsun and at the assault on Peking, August 14, 1900. Second Lieut. Peter Bartsch I desire to recommend for honorable mention for meritorious service during the campaign in China.

Visual signaling was practically not used during the campaign, though flags were carried by the advance party. After the occupation of Peking the length of stay of the American forces was uncertain, and it was not until about September 5 (see later report) that a permanent telegraph system was decided upon. Credit for the construction of this system, perhaps the best now standing in north China, is due to Lieutenants Bartsch and Hastings, both of whom are most capable officers, having great interest in their work and in the Signal Corps.

OBSERVATIONS IN FOREIGN TELEGRAPH CORPS.

The British signal department available for the advance consisted of a company of visual signalers, commanded by a captain, a telegraph detachment, consisting of 1 lieutenant and about 20 operators, composed of noncommissioned officer and men, and about 20 linemen, made up of British and native troops. Later (October 31) their total available signal force consisted of 1 company balloonists, 1 of telegraphers, and 1 of native sappers.

For instruments they use the high resistance, open circuit relay, their operators, apart from our own, being the only ones connected with the allied troops that could operate by sound.

Their office equipment and linemen's kits are put up in a manner that might well be copied. The office equipment consisting of instruments, blanks, stationery, office clock, office wire, small pliers, etc., and everything required by an office for some months, was packed in a small box, which occupies little space in transportation, and when installed equips the office.

The repairman's kit consists of heavy pliers, come-alongs, two-point digging bar, connectors, a quantity of tape, the whole done up in strong canvas bag. Both these arrangements go far to reducing the percentage of loss of tools from which we suffer in our service.

The British G. I. pole was the only specially constructed telegraph pole noticed in use. This is their standard military telegraph pole; is made of galvanized iron, is telescopic, weighs about 40 pounds, about 20 feet high, and capable of carrying three wires. This is an excellent pole for semipermanent line following field-telegraph lines. A No. 11 G. I. is used by them for both field and permanent lines.

The English buzzer, while not as good as our own, is superior in adjustment.

As to the personnel of the signal men of the English and American forces, it can only be said that the American is very far the superior in quickness, intelligence, and independence of action. There are probably no enlisted men in the world higher in intelligence than the soldiers of the American Signal Corps.

The personnel of the Russian field-telegraph department in China consisted of 1 colonel, 1 lieutenant-colonel, 1 captain, 4 lieutenants, and 200 enlisted men.

The field-telegraph line was erected on lances halfway from Tientsin to Peking, and the remainder was constructed of a $\frac{3}{4}$ -inch armored river cable, though this does not form part of their regular field equipment. The transportation was the ordinary Russian or Chinese cart, drawn by ponies. The line wire is of a size smaller than that used by our service and is, during construction, payed out from wooden reels somewhat resembling our own.

Their lances are of fir and about the same length as those of other nations, Japan excepted (about 20 feet). Their insulators are of the porcelain (double-petticoat pattern) and are fitted on a spike at the top of the lance or on the usual iron bracket when used on trees or high poles.

The field battery of the Russians consists of glass jars, carrying a porous cup with copper and zinc elements. It offers no appreciable advantage over our own, as judging from the amount of battery power used it is thought that its strength is not above the ordinary gravity cell. The Russians, as well as the Japanese, were operating with the open-circuit system and using the European Morse recording instruments.

The equipment of the Japanese telegraph department was very complete in all its details. The personnel consisted of 3 officers and 75 or 80 men. Their method of transporting supplies is by carts and pack ponies. Of the former they had about 20; of the latter, 75. In addition to this, they had and utilized Japanese cooly labor very extensively. Their lances are about 14 to 16 feet long and much lighter than ours. Rubber insulators, which are almost identical with our "rubber clamp" insulator, and secured to the lance by screw threads, or at times a "pigtail" pattern is suspended by wire to poles, trees, or buildings.

A great and certainly an advanced departure in the Japanese field telegraph work is the line itself, which is bare No. 14 copper wire, giving them all the advantage, from an electrical standpoint, which this wire possesses over other line material in use by other powers operating here.

On the whole, it has not suggested itself to me that any of the other signal corps or telegraph departments of the different nations assembled here possess anything of material advantage over our own, always excepting the transportation and packing for service in the field and the bamboo and telescopic iron telegraph poles of the English—the bamboo lance, because of its lightness and adaptability for service with the pony insulators as now used by us; the telescopic iron pole, on account of its lightness and value for the semipermanent line, which should in all cases follow the field line immediately. (The glass jars are an abomination and should be replaced by papier-mache cells, square in form, or by the old Eagle cell.)

Our field buzzer is excellent and was for several weeks the only instrument that could be used over the imperfect field line.

The English dry cell is recommended for our use. From actual test made by Lieutenant Bartsch it was found to work about 336 hours on closed circuit, in connection with a telegraph sounder, before exhaustion.

I desire to call attention to a device recommended by Lieutenant Bartsch for detecting the electrical condition of a telegraph line, and thus described by him, whether the same is in a state of rest or worked by some another station, viz: "While it is a matter of little import whether or no an operator at an intermediate station 'breaks' in while two others are working, it is nevertheless very annoying and delays work, and can be easily overcome by such simple means as the placing of an ordinary magnetic needle or compass in the wooden base of the relays near the electromagnets of the same, the condition of which will always show the state of the line. The needle should form part of the relays." It is recommended that the main-line

sounder be dropped as an article of field equipment on account of the weight of its armature, which does not admit of a delicate adjustment.

It is also recommended that chests or boxes for transport by wagon or by pack animal for visual signal stores and for field telegraph line material be devised by a competent officer of experience in the field and sent to every independent Signal Corps detachment, according to the requirements of each. The shipment of miscellaneous stores and commercial methods of boxing and transport are unsuitable for army service.

It is further suggested that a signal company should be composed of visual signal men and of telegraphers (operators) and linemen. The visual signal men should be provided with the usual kits, and with the company train should be carried a sufficient supply of lanterns, heliographs, rockets, and other devices for visual signaling. For the telegraph there should be carried in the company transport chests or boxes containing the instruments and battery necessary for use on a field line. It should not be expected that the flag and visual signal men be operators nor that operators should be called upon to perform the duties of the visual signal men. Of a company composed of a hundred signal men, 30 might be considered as operators, 20 as visual signal men, and the other 50 line or construction men. Two or three of the company should be expert electricians and be so rated.

It is understood that the French endeavored and succeeded in communicating by the Mansin instrument between Tientsin and Peking. In the early days of the occupation the Germans did not reach Peking by telegraph except through a commercial company under their protection, which reached the city about the middle of October. The Italians and Austrians apparently had no signal communication whatever between Peking and the fleet. Practically, visual signaling was not used by ourselves except in an effort made by Lieutenant Hastings on August 14 to communicate with the legations from the roof of a building in the Chinese city of Peking. The signals attracted attention, but failed to bring an intelligible reply.

All of which is respectfully submitted.

GEORGE P. SCRIVEN,
Chief Signal Officer, China Relief Expedition.

TEMPLE OF AGRICULTURE,
Pekin, China, October 5, 1900.

EXTRACT FROM REPORT OF MAJ. GEORGE P. SCRIVEN, SIGNAL CORPS, UNITED STATES VOLUNTEERS.

* * * * *

On August 16 the field telegraph, which had followed the advance of the American forces from Tientsin, reached Peking, about thirty hours after the occupation of the Tartar City, and several days before the appearance of the wires of either the Russian or Japanese army, the only two besides the English and ourselves who had attempted to maintain telegraphic communication with the base. The American lines had been built with the cooperation of the English engineers, who were better provided with transport and coolies than ourselves, and it had been successful. Immediately upon its arrival, however, the hastily laid field wire became overburdened with work. Messages not only of military character but from the diplomatic corps, from civilians, and from representatives of the press were offered in great numbers and transmitted in English, French, German, Italian, in code and plain language. Even Russian and Chinese messages were sent in cipher. Operators worked day and night and only by greatest exertion managed to clear business. During one interval of about thirty hours five hundred and twenty-four messages were sent over this one temporary line, some of them of great length; and in this connection First-Class Sergt. Thomas P. Akers is especially commended for his almost incessant work in the office, as well as for his efficiency and interest in the service. At one time he was the only American operator on duty at Peking, and the office was necessarily removed temporarily from the American legation, where it was first established, to the English legation. Later it was placed at the permanent headquarters of the expedition, at the grounds of the Temple of Agriculture. This military line was for some days the only means of communication with the outside world except by courier, for the railway and commercial telegraph lines had been destroyed, and mail routes had not been reestablished.

In addition to the excessive amount of work required of it, the light lance line was constantly interrupted either by the Chinese or by the transport of the allied armies, our own included. As an illustration it may be mentioned that Lieutenant Hastings reports the removal of a mile of wire in one section between Yangtsun and Pietsang,

and again at Hoshiwu a hundred yards or more were taken out. Upon being replaced by him the section was again cut before he had returned to his station. This was evidently the work of the Chinese, as in the former case a repair party was fired upon in this section; and in the latter, troops could not be suspected. Frequent instances occurred of the removal of from 100 to 300 yards of wire, as reported by Lieutenant Hastings, and many cases of cutting not necessary to mention here came to the knowledge of signal officers.

Serious interference was also experienced from the Russians and Japanese, whose telegraph lines followed ours into Peking, and whose soldiers in some cases, from ignorance, permitted the lines to conflict or injure the American line. It became evident, therefore, that in spite of the uncertainty attending the occupation of Peking, which had prevented the immediate commencement of a semipermanent system, a substantial telegraph line was a necessity, and a request to be allowed to construct such was made by the chief signal officer and granted about September 4. Before this was begun, however, every effort was made to strengthen the old line in order to avoid the expense of constructing a new, which would become useless in event of the immediate evacuation of Peking. Lieutenant Stamford was therefore retained at Peking, Lieutenant Bartsch was ordered to take station at Yangtsun, and Lieutenant Hastings was sent down the line to repair and maintain the section from Tungchow south. But as the amount of work continued excessive and delays were many and vexatious, it became evident that none but official messages could be handled until the new line was constructed. Upon the recommendation of the chief signal officer, therefore, and by order of the American and English generals commanding, the old line was temporarily closed to private and press messages and to all but the American and English legations. By this time a Russian and Japanese line had reached the city and it was no longer necessary to use the American-English line exclusively. The Imperial customs post had also been reestablished. In spite of the improvement caused by this change, messages were much delayed. English operators using closed-circuit instruments, to which they were unaccustomed, worked slowly, and were often at fault in their adjustments. Not enough American operators were present in China to man the stations, though on their way from the United States; batteries were too weak to overcome the heavy resistance of the often-spliced wire, repaired by uninstructed patrols, frequently of the Indian cavalry; and, lastly, as there were not enough American relays for the offices established, box sounders were used not suitable for the purpose on account of the heavy armature and British instruments of 500 ohms resistance necessarily employed with the already weakened current.

These were some of the difficulties which had to be met in the rapid advance made by the allies on Peking. They all disappeared with the arrival of material and American operators from the *Sumner* and the construction of the new line, which by October 3 reached Peking; after which an excellent service was established. But, notwithstanding its faults, the field line from Tientsin to Peking did its work as a temporary line, and was indispensable to the army as well as the people of the city, and the fact that it was the only field telegraph with or near the allies at the occupation reflects great credit upon Lieutenant Stamford, of the Signal Corps, and Lieutenant Loch, of the Royal Engineers, to whom its construction was due. As I shall have occasion to remark in my full report, these officers carried the line through in spite of almost insurmountable obstacles, displaying energy and spirit worthy of high commendation. Soon after the occupation of Peking by the allied armies, it became evident that the cable company, whose office was then at Chefoo, was unable to perform the work put upon it. At first an effort had been made to transmit the messages of all nations, official, private, and press, but the company was soon obliged to restrict its business to official communications only. At this time dispatches were sent from Tongku by boat to the fleet, thence by a dispatch boat to Chefoo, the terminus of the Chinese land line, over which messages were sent to Shanghai. The land line from Chefoo to Shanghai was frequently interrupted, and the operators, many of whom were Chinese, were slow. An improvement was made, however, when the Danish Cable Company carried the line from Chefoo to Tongku, but for a time the service was again very faulty, cablegrams being received at the cable office at Tongku from five to twenty days after they had been filed in London or Washington, and a case or two was reported of cables being more than thirty days in transit. In addition, code messages were frequently so garbled as to be unintelligible, a fault for which it is believed that the cables were very largely to blame. So great was this difficulty at one time that the chief signal officer of the expedition suggested that plain language be used in messages from Washington for China. Such messages pass through so large a number of offices in transit that the chance of correct delivery is small. An investigation as to the causes of delays and inaccuracies was directed by the chief signal officer and Lieutenant Stamford sent to Tongku for the purpose. Under date of September 27 he reports as follows:

"While the operators on our military line are not above mistakes, the great number of errors in messages received can not justly be charged to these men. This is especially applicable in the case of the War Department cipher messages. The Western Union code being neither figures nor English words, the best operators in the world can not guarantee against errors, for which reason I have advised against its use, as cables pass through entirely too many hands over the distance from the United States to insure accuracy. On examination of the files of Tientsin and Tongku I found but one error in the War Department cipher messages sent from Pekin for transmission, which error, however, would not render them undecipherable. The code messages I can tell nothing about without comparing with the book word for word, and as they are neither figures nor English words, the operator is likewise unable to tell whether they are right or wrong.

"All the United States cipher messages received at Tientsin and sent over the south end of the line are repeated back, in compliance with an order issued to the operators by me long since.

"It should be borne in mind that until the 8th of September the cable company was working with Chinese operators, who, as the manager informed me, made innumerable errors, and to put it in his own language, 'near drove him to drink;' also, they had but one set of instruments. They now have European operators and three conductors, so will be able to handle business in very good shape from now out."

Lieutenant Loch, in a letter dated September 27, writes as follows:

"I have carefully checked many thousand figures and words in code and cipher messages dispatched from Pekin and Tientsin, and find that the mistakes have been wonderfully few. The words in the cases where the mistakes had occurred were often illegibly written, and this was usually in messages from Tongku on the American wire and forwarded to Pekin on my wire. I have naturally not checked any American messages, so have not seen any of those of which General Chaffee complains, but Lieutenant Stamford assures me that they have been equally free from mistakes."

It now became evident that a permanent line from Pekin to Taku was of first importance. Combination with the English, absolutely necessary at first, and successful with the field line, did not answer its purpose under the changed conditions, and a wire worked by American methods, with the closed circuit, and none but American operators become a necessity. The operators to make this line effective were then approaching Taku by steamer. This new line was commenced September 5. The main difficulties in its construction were lack of transportation and the growing scarcity of poles, then, as now, much in demand for the military telegraph of other nations as well as our own, and for a commercial line that was endeavoring to push its way north from Tientsin.

As the army at Pekin was at this time supplied from Tungchow, 16 miles away, on the Peiho, by wagon and pack train, and every animal and wagon was in use, only one wagon and three mules could be taken from the army transport for line construction, and recourse was had to native carts drawn by mules and ponies; but so small were these carts and so indifferent the animals that a load of 200 pounds could with difficulty be drawn, and even over a slightly muddy road, from carts loaded with 6 poles weighing 35 to 40 pounds apiece, it was necessary to throw off the loads and go on to Tungchow empty. However, on September 6, 20 of these carts and 60 coolies under a guard of 25 men were obtained and sent under charge of Lieutenant Stamford to Tungchow, and work was begun. I desire to call attention here emphatically to the necessity for the Signal Corps to possess and control its own transportation, otherwise the telegraph service is dependent on the overburdened general transport of the Army and may be delayed at critical moments. No body of signalmen or telegraphers should take the field without horses and properly equipped wagons or carts under the control of the signal officer. This subject is touched upon in my full report and is only mentioned here incidentally.

The signal officer of the expedition, anticipating a lack of poles in China had requested by cable, a few days after his arrival, that 3,000 iron poles be sent; but it was not expected that these could arrive in time for the advance, even if sent at all, owing to difficulties of transport. (At the present time they are not desired unless an unexpected extension of the permanent telegraph system is directed in China.) Poles of a certain kind, answering moderately for a light line, were found in abundance during the early days of occupation at Pekin and Tungchow, but, being used freely by the allies for buildings, for firewoods, and other purposes, were becoming scarce. Orders, however, were sent to secure all available poles at Tungchow and send them down the river on junks controlled by the quartermaster's department to Matao, Hoshiwu, and Yangtsun in numbers sufficient to build the sections of line between these

points. About 1,000 poles, mostly small fir trees (which are imported, it is said, from Oregon or British Columbia and used for the masts of junks, for building scaffoldings, and as banner or sign poles) were in this way secured, and Lieutenant Hastings, then at Hoshiwu, was directed to commence the construction between that point and Matao. On September 9 this work was begun, and on September 12 the section, 15 miles, was completed. At this date the old section between Hoshiwu and Matao was cut out and great improvement immediately noted on the line. Lieutenant Hastings in his report says:

"Owing to a scarcity of operators in our corps and to a scarcity of instruments with the royal engineer telegraph corps, the work at the offices until the arrival of more American operators was done at all of the stations on my section by British operators, using American instruments. As these men are trained in the use of open-circuit instruments, they were ignorant concerning the adjustment and care of our box relays, and many delays are traceable to the fact that these operators could not adjust so as to work with a weak or variable current. Although in nearly every case that came under my notice the men were willing and ready to work night and day, they could not do as good work under these circumstances as our men would have done, or as they would have done with their own instruments. * * *

"The working party was fired upon by the Chinese at a small village near Matao on the 10th of September; no casualties. * * *

"The line was completed through to Tungchow on the 30th of September and to Peking on the 4th of October. This has been practically the end of trouble on the line."

The old field line from Peking to Yangtsun was now turned over to the English for their use, and American wire placed on their (iron) poles, recently erected between Yangtsun and Tientsin, giving an all-American wire from Peking to Tientsin. Thence to Taku the old line, built by Lieutenant Stamford before the occupation of Tientsin and supported partly on the Russian poles, continues to be used until a permanent line, now (October 5) nearly finished, can replace it. This line is a single No. 14 galvanized-iron wire from Peking to Tungchow, Matao-Hoshiwu to Yangtsun; thence one of three to Tientsin. It is placed on poles in general 24 feet long, 5 to 6 inches diameter at base, 3 inches at top. Pony insulators, brackets nailed and wired. It is a strong, serviceable line, with poles sunk 4 feet into the ground. At present there are by order 3 permanent stations established, viz, at Peking, Tientsin, and Tongku; in addition there is a station at Tungchow, where a company of infantry is and will continue to be stationed; also at Matao, Hoshiwu, and Yangtsun, where no American troops will be kept, but the repair men can live in or near the foreign garrison. The line has been extended to Taku and an office established near the cable office (in a Russian fort on right bank of river). The line, therefore, crosses the Peiho four times, once by the iron bridge at Yangtsun, twice in and out near Tientsin, and once south of Tongku by cable. Two strands of the German cable having been secured for our use until the arrival of new shore end cable from Manila,* which will be sufficiently strong to resist floating ice in the Peiho, a lighter cable is now on its way to Taku. The batteries are placed at Tientsin and Peking and consist of 23 gravity cells at the former and 32 at the latter station. This battery power will be increased as soon as additional material arrives, but at present it works well.

On September 24 the office of the military telegraph line was established in a building of the grounds of the Temple of Agriculture (or Temple of Earth) south of the Chinese city, near the offices of the major-general commanding and general staff established about this time. The old field line was turned over to the British, and an independent wire is now in use by each nation between Peking and Tientsin, though of course in the event of interruption either line is placed at the disposal of the other nation interested. From Tientsin to Taku the English will use the American line until their own can be completed.

Telephones.—Soon after the establishment of the camp at the Temple of Agriculture (August 16, 1900) a telephone line was placed connecting the camp with the legation of the United States; later the headquarters of the First Brigade were placed in the circuit. On September 30 there were three telephones in use at Tongku and two at Tientsin. The system at Peking will be extended as soon as additional telephones can be obtained.

In conclusion, I desire to call attention to the great difficulty attending the supply of material in China. Distance from the United States practically prohibits requisition on that country except for needs far in the future, and even from Manila stores can only be obtained after long delays. Once at Taku, days, or more probably weeks, must elapse before these stores can be carried up the Peiho by junks. It is to be

* This was not sent.

remembered that practically nothing in the way of electric or industrial supplies can now be purchased in northeast China, and mails have been so slow and irregular that four weeks have been required for a letter to reach Pekin from Nagasaki.

November 1, 1900.

* * * * *

On September 24 the headquarters telegraph office was established at the Temple of Agriculture, to which place the adjutant-general's office was about that date removed, and on October 4 the new permanent line from Yangtsun to Pekin was completed and the American system separated from the English. The latter were given entire control of the old line, permitting, in return, the use of a wire on their new iron poles from Yangtsun to Tientsin. Additional American operators, battery material, and relays had arrived, and from that time forth vexatious delays ceased and the telegraph service from Pekin to Tientsin and Taku became as good as need be desired. Applications for the use of the American wire have come from the Russian, French, and English during the month.

Only two breaks have occurred in that time, the longer interruption caused by the falling branch of a tree during the heavy storm of October 20, costing about four hours delay. This storm broke down all the other lines.

The English, when in difficulty with the old line, were of course given the use of the American wire, and relations have continued cordial.

The new line is considered excellent, and the credit for its construction is due to Lieutenant Bartsch and Hastings.

On October 17 a repair party under charge of First Class Seryt. Charles H. Trotter was sent to Tongku to thoroughly overhaul and strengthen the line from Pekin down. This party has, it is believed, put the line in thorough shape for withstanding the winter storms. The work was completed October 26.

Shortly after the arrival of the Danish cable at Taku, where it was installed in a fort occupied by the Russians, on the right bank of the Peiho, the old military line was continued from Tongku to Taku across the river by cable, and an office was established at the latter place.

From Tientsin to Tongku the old line, built by Lieutenant Stamford before the advance from the former place, continued until about the end of the month to be the only wire for use by the Americans and English, and the amount of business done over it was enormous. This line, a temporary one with makeshift supports or carried on Russian poles, it became necessary to replace by a permanent system. For this purpose it was again necessary to ship poles down the river by junks from Pekin, as the poles below had long since disappeared. These were secured in part from the public stores in Pekin under American control, in part from Chinese residents of the American section, who were paid an average of 75 cents gold per pole. Two hundred and sixty poles were thus purchased. The new line, begun October 22 by Lieutenant Capron, was practically completed October 30. On October 31 it was used as a through line from Pekin to Taku. It has not yet been thoroughly tested, but now works well. Like the northern section, from Yangtsun to Pekin, it consists of a single wire, No. 14 galvanized iron, placed on poles in general 24 feet long, 5 and 6 inches at base, sunk 4 feet in the ground, pony insulators, brackets nailed and wired. The new section crosses the Peiho three times by cable, twice at Tientsin, to right bank and again to left, and once again near Taku to telegraph station near cable office on right bank. The cable used at Tientsin, obtained from the Germans, is armored, about 1½ inches diameter, and in good condition. This cable crossing is at French pontoon bridge near the railroad depot. The cable near Taku was obtained from Manila. It is a single conductor and should be in place to-day.

Present telegraph system.—The existing telegraph system of the United States in China consists of one (No. 14 galvanized iron) permanent wire, supported on wooden poles, which extend (see map) from the headquarters office through the city of Pekin to Tungchow, along the right bank of the Peiho through Matao and Hoshiwu to Yangtsun, where it crosses the river by the iron railroad bridge, is looped to the British garrison at that place, which is a repair station supplied with necessary material and maintained by two signal corps men there quartered. From Yangtsun the wire is carried on English iron poles along the railway to Tientsin, where it crosses to the right bank of the Pei-ho by an armored cable, thence again to the left bank by a second strand in same cable, thence along the railway to Tongku, thence about 2 miles south to cable across river to office near Russian fort on right bank. The distances are approximately as follows: Headquarters temple of agriculture to Tungchow, 19 miles; Tungchow to Matao, 15 miles; Matao to Hoshiwu, 14 miles; Hoshiwu to Yangtsun and loop, 25 miles; Yangtsun to Tientsin,

18 miles; Tientsin to Tongku, 28 miles; Tongku to telegraph office, Taku, 3 miles. Total, 122 miles land line.

Stations.—Permanent stations are established as follows: Headquarters office, Pekin, with 3 operators and 3 linemen; Tungchow office, 1 operator, 1 lineman; Tientsin office, 6 operators, 3 linemen; Tongku office, 2 operators, 1 lineman.

Temporary and repair stations: Matao office, 1 operator, 1 lineman; Hoshiwu office, 1 operator, 1 lineman; Yangtsun office, 1 operator, 1 lineman.

At Matao, Hoshiwu, and Yangtsun the men are, or will be, quartered in or near the garrison of British troops, our own having been withdrawn, or about to be. A suitable amount of repair material will be stored at all stations as soon as practicable.

Batteries.—The main batteries are placed at Pekin and Tientsin—32 cells placed at Pekin and 23 at Tientsin. Those used on the Tientsin-Tongku section consist of 25 gravity cells at Tientsin. The battery power is $(25 + 23 + 32)$ 80 cells.

The old field line still stands from Pekin to Yangtsun and should be permitted to remain as an auxiliary line as long as needed. This old line is in partial use by the English, and it is understood that they are building a new line from Pekin to Tientsin, which will be carried to Taku, thus leaving the old American wire (still serviceable) free for use from Tientsin to Taku, and giving an all-American line between those places, and a through wire from the Pekin to the Taku office. The system is serviceable at present and should continue so for many months to come. It is thought that the wooden poles will last in this dry climate from one to two years.

Business.—The amount of business done during the month—i. e., from October 4 to October 31, inclusive—was as follows:

Messages sent	5,928
Messages received	5,882
Total handled.....	11,810

An average handled per day of 422 messages, some of which were of great length and many in cipher. The amount of business has been steadily increasing and is now very great, as shown by the appended tables.

Interruptions.—The interruptions have been few. Besides two breaks mentioned, they were caused by crosses with other wires in Pekin and Tientsin. The total interruptions from these causes cost about four hours' delay in case of breaks, and one or two hours in case of crosses.

Other lines.—In addition to the British and American systems there now enters Pekin from Tientsin one Russian military line, one Japanese military line, and a commercial line, understood to be under the protection of the German Government. No German, French, Italian, or Austrian military line has reached the city. The commercial line has now one wire to Tientsin, and it is said will soon erect another. The company receives telegrams for all parts of the world. The following rates are quoted:

Pekin to—	
Tientsin.....	per word, Mexican currency.. \$0.30
Shanghai.....	do..... .72
Hongkong.....	do..... 1.12
New York.....	do..... 3.80
San Francisco.....	do..... 3.85
Japan.....	do..... 1.42

The new American military line being completed it was found that press messages could again be transmitted, and October 6 permission was given to American correspondents, by order of the major-general commanding, to use the military system free of charge under certain conditions as to number of words, time of filing, etc., but the privilege was not extended to foreigners, and was given only over the section from Pekin to Tientsin. Beyond the latter place a commercial line existed, and the American wire, carrying both American and British official messages, was fully occupied. It is thought, however, that with the completion of the new line, Tientsin to Taku, American press messages can be carried. A proper charge therefor should be made. It is probable that a new commercial line will follow the railway, should the latter be completed to Pekin during the winter.

In this connection I desire to recommend the establishment of some means of payment of cable messages sent by officers and men from Pekin. Cable companies require cash payment on delivery of messages, and as no office at Pekin exists except that of the expensive commercial line, charging 15 cents gold per word from Pekin

to Tientsin, and money can not be forwarded the cable company for immediate payment, it is thought that the quartermaster or other person at Tongku or Tientsin might be supplied with a fund for the purpose and authorized to pay cash to the cable company, collecting afterwards from senders of messages.

Telephone systems.—There are at present three telephones in use at Tongku and two at Tientsin. At Pekin one line exists, with telephones at the United States legation, headquarters of the expedition; office of the provost-marshal American section Chinese city, and office of the provost-marshal, Tartar city. The extent of the telephone line in Tongku is about 4 miles, in Tientsin about 1 mile, in Pekin about 5½ miles; total telephone line, 10½ miles; total telegraph line, 122 miles. In all, there are 132½ miles of electric communication now in operation.

EXTRACTS FROM REPORT OF LIEUT. H. W. STAMFORD, SIGNAL CORPS, ON OPERATIONS OF SIGNAL CORPS IN CHINA.

TIENTSIN, CHINA, July 31, 1900.

While at San Isidro, island of Luzon, P. I., I received instructions to proceed to Manila for duty with the expedition going to China. The excessive rains that had prevailed for a week or more had so completely water bound the towns that I had some difficulty in leaving the district, but finally managed to sail down the river on a banka to Candaba. There I secured passage on river steamer to Calumpit, on the railroad, and caught a train conveying the Ninth Infantry to Manila, reaching that city the evening of the 22d.

I found on reporting to the chief signal officer that a detachment of ten signal corps men had been detailed to accompany me, and the necessary stores and material for the construction of about 100 miles of line, minus telegraph poles, packed ready for shipment on the transport. This very thoughtful arrangement on the part of Colonel Allen left some little time for myself and members of the detachment to make some personal arrangements as to necessities not obtainable in China; also articles still unpacked were gone over carefully, the insulated wire unwound in half-mile coils and joints taped—this at the suggestion of Captain Carr. While speaking of this matter of rewinding the insulated wire, I would recommend this method not be adopted for future operations. If the material is to be handled but once the plan of rewinding the wire may save some labor in construction, but if the distance be considerable and material is likely to receive much handling it is a great mistake to remove the burlap wrapping or in any way alter the original compactness of the coil. No matter how carefully the wire is rewound and tied, the original strong machine-wound coil can not be improved upon for purposes of transportation and construction, and frequent handling of the rewound coils produces a snarl that is almost beyond unraveling.

On June 24 I reported to Col. Emerson H. Liscum, Ninth Infantry, commanding China Relief Expedition.

On the morning of June 26 boarded transport *Logan* with seven of the detachment, viz, Sergeants Courtwright, Wilcomb, Trotter, Akers, Lee, Corporal Yandeau, and Private Smith, the remaining three men, viz, Sergeant Gunnison, Privates Headington and Carroll, being detailed on transport *Port Albert* for purpose of keeping up communication between transports en route. This by direction of the colonel commanding. However, the *Port Albert* did not leave Manila with us or accompany on the trip, and, further, did not reach China till some days after us. Thus the services of these three men were lost to me for some time, nor did they join me until the pole line to Tientsin was completed.

Left Manila Harbor evening of June 27, reaching the anchorage 8 or 10 miles from Taku on July 6.

Went ashore the following morning with Colonel Liscum and staff, the distance to Taku by water being about 12 miles. Took the opportunity while ashore to run up the railroad as far as it extended toward Tientsin to look over the ground with a view of constructing line to that point. Found the line for the most part had been destroyed by Boxers. Poles with wire stood in some places, but most of them had been cut down. The northern half of the section had been completely destroyed.

On returning to the transport I found the plan for disembarkation was to load on light-draft lighters and have them towed up the river direct to Tientsin. I determined, therefore, to load sufficient material, if possible, on the first lighter to enable

me to construct line to or almost into Tientsin, allowing remainder of material to go up river with the other Government property. I had taken the precaution when loading in Manila to see that my property went on transport last, so I might have some chance of getting it off first, but as the steamer developed a considerable list the cargo had to be shifted and my calculations were badly upset in this respect. At 3 a. m., morning of the 8th, I went in the hold of the transport and took upon myself the work of directing the crew unload, but took good care my own material went up first, and after considerable shifting of cargo succeeded in getting what I required and had it placed on deck of lighter. As loading of lighter was about completed a naval officer ran alongside in a tug and informed the commanding officer that it would be impossible to get any of the lighters over the bar till the night's tide. This would give me a delay of ten hours, so I asked him if he would take myself and party ashore if I transferred them to his tug. He consented to do this if I would load the material down in the cabin, so as not to roll him over crossing the bar. Thus the first of the expedition, consisting of the detachment of the Signal Corps, made the first landing. We were not long ashore before we discovered the fact that operations in conjunction with allied troops was to be an entirely different proposition to our late operations in Cuba and the Philippines, where we were always in touch with our people. Every house and patch of ground was preempted by some nation if there was a spot to float a flag on it. You could not leave any description of stores out of sight for a moment without running the risk of losing it altogether. Any article one might want, from a hammer to a railroad truck, would be claimed by some one.

July 9 was occupied getting a clear line through the wrecked remains of the railroad lines to office and to outskirts of town; also constructing hand cars for transportation, no other transportation being available. Captain Wise, of the U. S. S. *Monocacy*, rendered me valuable assistance in his capacity as officer in charge, port of Tongku. I had funds for purpose of employ of coolie labor, but every Chinaman in the vicinity that had not been killed had been impressed by one or another of the nations, and the coolies I did obtain were furnished me by Captain Wise. He supplied me with anything he had to spare from his stores, and made my men comfortable on the gunboat the short time they were there; also took care of the operator and lineman I had to leave behind in Tongku, and in numerous ways extended many courtesies, for which I feel extremely grateful.

July 10 we got well under way with the work, using buzzer line, naked wire No. 14, as we were unable to get at battery material in hold of ship. Where poles remained standing line was erected on poles, but in other places it was laid on the broken stones of the railroad away from the track as far as the reconstruction of the railway extended, and beyond this point carried it off to one side.

The discouraging experiences met with in the construction of this short piece of line would, if recorded, make a report by itself. Our work at first was very much hampered by the Russians, who appeared to think we were trampling on their sacred rights by erecting a wire along the railroad they guarded. The American soldier was so little known to them that they immediately strengthened their outposts on our approach, and we could plainly see them loading their rifles to be ready for use. I always considered the party in more danger from being fired on by the allied troops than the Boxers. It is, perhaps, just to say of the Russians that one reason for their unfriendliness was the interference by our buzzer with their telephone service. They could always hear the buzzer in their 'phones, and as the telegraph line they were then constructing was being continually interrupted from various causes they gave our line credit for the cause of all their ills. If their own line did not work, I am positive they promptly went forth and cut ours. In fact, the telegraph officer at the station between Tientsin and Tongku informed me he had gone out for that purpose, but that Colonel Samoyeff (of whom I shall speak later) gave him positive orders to leave my line alone. As they guarded the entire length of the railways, they could very easily break our communication without our being able to obtain any proof of it. At this same station we were at three different times stopped by the Russians, causing vexatious delay and annoyance. The officer in charge on the first occasion (a colonel) declined to allow us to use the railroad poles which happened to be still standing at that point, and said that he was ready to defend them with his life and his guns if necessary. As they had 300 rifles (his own figures) and 4 rapid-fire guns and we had 1 carbine, I considered he had the best of the argument. I endeavored to convince him our line had nothing to do with his; also I did not concede they had any more right to the line of communication than any other nation, and that the United States proposed building a line, his objections notwithstanding. I also informed him he would have to settle the matter by the morning or I should report it to his superiors, and at the same time take occasion to mention his discourteous conduct. He then sent for instructions, and in the morning informed me his general

had instructed him to allow me to proceed with the work. These interruptions from this quarter continued, however, in one way or another until I was able to meet Colonel Samoyloff, of the Russian general staff, and who had entire control of their line communication. I found the colonel a man of education and a perfect gentleman, and I very soon came to a perfect understanding with him. I went into the subject of their open and our closed systems to some extent; frankly admitted the buzzer could be heard in their telephones, but it would in no way interfere with his telephone line. He then informed me he would give orders to have his telephone taken out, so his people would have no cause for complaint; also he would give orders that would prevent our men being bothered in the future, and would give directions that the Cossacks in patrolling their line should, in addition, look after ours. At that time the Russians found it necessary to send mounted parties over the line twice every night. In return for this I stated our men would repair any breaks found in their line, and if unable to do so would report the trouble to the nearest Russian camp.

On the evening of the 12th the party camped with Russian outpost some 5 miles from Tientsin, and on the morning of the 13th (old Tientsin fell into hands of allied troops this day) went into Tientsin along the railroad track, which at the time was under shell fire from the Chinese heavy guns. Party continued along track until turned aside by Russians, who would not allow them to go farther, as they might draw the Chinese fire. It was in this immediate vicinity the Russians sustained their heavy losses. The French and Russian batteries placed in position here under cover of darkness were forced to retire at daybreak. Going back over this ground some hours later to repair break in line, I saw trains of Russian carts bringing in their killed and wounded, and about 100 yards from me the Chinese dropped a large shell in the middle of a party of Russians collecting their dead and wounded and apparently killed every one of them.

Praise is due the following members of the corps for their conduct and work on this occasion: Sergeants Wilcomb, Trotter, Akers, Corporal Yandean, and Private Smith. The heat was something unbearable; they had been compelled to abandon hand car where the railroad ended and carry the wire and stores. For drinking water for the most part of the trip we were obliged to obtain it from the brackish ditches along the track, which contained, as a rule, dead Chinamen or dead dogs. On the occasions when we had time to boil the water it required more time to remove the scum that formed on the surface than it did to cook the whole meal. After the line was run into the city it was scarcely put in operation when the party had to contend with a succession of interruptions until we succeeded in erecting the line on poles the entire distance. The causes that led to these interruptions were in part due to our inability to pole the line the whole distance in the first place and interference from ignorance or design on the part of the Russians.

July 17 received our first assistance from our own troops, same being in the form of an army wagon. The line by this time was practically completed, notwithstanding the fact we were compelled to resort to the use of 4-inch plank for poles for considerable of the distance. I forgot to mention that the wagon was given to the party in connection with some other work laid out for it by the quartermaster.

On the 18th I went over the entire length of line from Tientsin to Tongku on bicycle alone to locate a fault, and found it midway between last Russian outpost and Tongku. On arriving at the latter place, found the line in good working order. Sergeant Trotter also made this trip some days later on horseback, and was fired on by Chinese.

On 19th was obliged to change location of office in Tongku and install it in the pilot house of the U. S. S. *Monocacy*, same being occasioned by the transfer of railroad and buildings pertaining thereto to Russian control. No sooner accomplished this than the entire work was torn out by a passing train. Some timbers protruding from the cars struck the railroad poles and knocked them down for some distance. Russian officer very promptly detailed five men to assist me repair the damage. As I had no one with me but the operator, was very glad to have this help.

As previously stated, party entered Tientsin during the night of the 13th, arriving there before the Third Battalion of the Ninth Infantry had disembarked. The erection of the line on poles completed on 20th and line in good working order that date. However, our troubles had not ended by any means. It became necessary to cross the Peiho, which is an extremely swift stream, and in Tientsin was alive with junks. No permanently constructed bridge crossed the river in the foreign concessions and numerous pontoons had been erected. The junks pass up and down through the city by poling, using a long, heavy pole armed at the end with an iron hook and spike. On going downstream they steady themselves by dragging anchors. It can be readily understood that nothing but very powerful cable would stand any such usage. Of cable we had none of any description, and improvised some by stranding

insulated wire. At times this improvised cable would be broken daily, and we have put in place as high as five in one day. The pontons could not be used, as they were broken open for passage of various craft as often as they were closed; so the plan of laying a wire on the bridge was adopted, stationing a man at the draw to connect and disconnect if the bridge was thrown open. By this means we were able to prevent much delay in traffic while a new cable was being put in place. Twice our cable got buried in the mud, and very fortunately remained undisturbed on both occasions for some time. Even at present writing (September 30) we are still using this means to cross the river, but cable requested some time since is expected daily. I tried to overcome this difficulty by elevating the line far above the river level, selecting one of the mud fortifications on one side and a three-story building on the other, using the tallest poles I could secure, but the span was too long and the first junk coming up the river broke the wire. Tried this experiment later, this time getting the assistance of the engineers and splicing the poles, but a steamer with tall masts steamed upstream and knocked it down again. After that, returned to former tactics of improvising cable from insulated wire.

The above covers the work performed by the detachment in the month of July. Much work and alterations of line had to be done in the city after we got settled there; a short telephone line consisting of three stations was erected and installed. Major-General Chaffee having arrived on the 30th and taken up his quarters in the collector's residence, the line was extended there and instruments in operation a short time after his arrival.

SIGNAL OFFICE,
Pekin, China, August 31, 1900.

Having been informed July 31 that all troops should be in readiness to move forward on the advance to Peking on two days' notice, I hastily went over the equipment to see if we were in a position to follow the column with a field telegraph line.

I found we had the necessary wire, brackets, and nearly enough insulators, but somewhat short of battery material and entirely without lances or light poles. For transportation we had one army wagon.

The want of suitable light poles was a serious one. The country surrounding Tientsin is a low, unbroken plain, almost destitute of timbers such as would be required for telegraph poles. Heavy poles I could not handle and keep up with the troops, even if same were obtainable. While going over this matter I met the British engineer officer and learned that while they had plenty of light bamboo lances, which they had brought from India, and were better off for transportation than myself, his wire was rather heavy for quick field work; he lacked suitable brackets and insulators; also, had no wagon adapted for the purpose of conveying the poles. We therefore decided to combine our forces and together construct a field line that would answer temporarily for both American and British commands. We agreed they should supply the lances, pack mules for carrying the wire, some linemen, and some native sappers, while we should use our No. 14 wire and glass insulators, which could be readily attached to the lances. I contemplated that with the army wagon for the poles, and mules and carts for wire, rations, and other material, we could do pretty rapid work. I made known the facts of these arrangements to the commanding general upon his arrival, and he concurred in them, as did also the chief signal officer when I reported facts to him.

On the 1st instant a message was brought to me saying the commanding general desired to see me at the Ninth Infantry headquarters. I found the general personally going over the question of transportation for the entire command. On reporting, he informed me he much regretted being compelled to take the army wagon away from me, as the transportation was so extremely limited everything was required for ammunition and rations, and for me to do the best I could without it. It should be stated that at the time the transportation of the Fourteenth Infantry, the Sixth Cavalry, the artillery, and the pack train was still on the transports at Taku, or had not yet arrived.

I had depended so entirely on having the wagon for the poles that the information conveyed to me by the commanding general was a sad blow, coming as it did at that late hour; however, I realized how important it was to have transportation for rations and ammunition, and started out to do the best I could without it.

All supplies for the various forces, and for which no land transportation could be furnished, was to be sent up by river in junks, and the conference of generals had evidently mapped out the line of march with a view to selecting camps where road

was close to the river, thus to be near the reserve supply of junks. A regular sailing order of column was arranged for the junk fleets of the various nations, which order was comparatively well preserved the first and second days; after that the above arrangements were of little value, as some junks moved faster than others and the troops traveled faster than the junks.

Returning to the subject of transportation, I had the party immediately set about commandeering carts, and under Sergeant Trotter managed to secure three very small ones. I informed Lieutenant Loch, the engineer officer working with me, of our loss of the wagon, and, after talking it over, we concluded to send everything up on a lighter, which he would secure, taking with our now limited transportation sufficient material for the day's work. In this, of course, we ran the very serious risk of not being able to connect with the lighter. The fact that the lighters could not keep up prevented our entering Peking with the troops.

On the 3d the line was extended north beyond Tientsin to a point beyond that selected for the first camp of the allied troops.

On the 4th instant the allied troops left Tientsin for Peking, going some few miles north and there going into camp. The Signal Corps had already constructed line, so the first field office was installed as soon as the command arrived.

The working party now consisted of myself, Lieutenant Loch, Royal engineers; 7 Signal Corps men, 2 British linemen, 4 native sappers, and an average of 30 to 40 coolies. We started with more coolies, but nothing but a very strong guard could watch them and prevent their deserting.

On 5th the battle of Pietsang occurred. This day the American troops formed the support on the left flank, and in moving forward made a considerable detour to the westward. This caused some conjecture as to what route to take with the wire. No one appeared to know what road would be followed, or, for that matter, anything about the roads. After riding considerably over the field I got an opportunity to view the situation from the Russian artillery conning tripod, and concluded both American and British troops must eventually close in on the river; so construction was continued with that object in view, following the road already taken in rear of the right flank, and at dusk we completed the line to the camp at Pietsang, which the enemy had abandoned after a hard fight.

Before leaving Tientsin the junk containing our reserve supplies had been placed in charge of a corporal of the Royal Engineers, and I must say he performed his work in a very creditable manner. On top of the high mast of his junk he had rigged a 4-foot red American signal flag, which greatly assisted us in locating its progress and position; also, fixing our own position with reference to the river.

Early the next morning Lieutenant Loch came to me with the information that we should not be able to connect with the junk that evening. A sailing order for the day provided that the American fleet should go first and the British third; moreover, he had received positive orders from his chief of staff that British junks must keep together, and could I not do something to help the matter? I told Mr. Loch we could readily overcome that difficulty by my giving the corporal instructions to consider his boat an American junk that day, and gave him instructions to keep well up to the front. The corporal carried out his instructions by again landing his junk directly in front of our camp.

Continued the construction toward Yangtsun, the objective for this day's march, meeting considerable difficulty getting under way, for notwithstanding our early start we were continually being blocked by the column and much delayed by breakdowns of our own and other transportation. The loss of the wagon was very much felt this day; we were compelled to bring up the material in relays. The destruction of two of the carts necessitated the abandonment of all personal baggage (blanket rolls) and part of the rations in order to have a cart for the poles, or give up all hope of completing the line to the camp that day. We decided to leave the baggage, and by this means reached camp at a reasonable hour in the evening. The army remained in this camp all the following day resting up, and owing to this I was able to secure a wagon the evening we arrived, and, sending it back, recovered the baggage and rations. It was fortunate for us the army remained here a day, for 150 feet of line in one place and about 1,200 feet in another was cut out behind us. The day was therefore occupied in repairing these breaks and poling some insulated wire which had been used to run into camp the night before, our day's supply of lances having given out. On August 8 the command moved as far as Tientsin. Between Yangtsun and Tientsin the river winds some distance to the east, and the road taken by the major portion of the command followed the river pretty closely; however, the line was constructed on a more direct route, to save both time and labor. This road took us some miles to the westward, and the party began meeting considerable Chinamen, exchanging shots with them at one village, but experienced no serious oppo-

sition. It was thought for a time we were wandering entirely from the proper route. The difficulties met with in operating in a strange country were particularly exemplified on this occasion. The only map in our possession was found unreliable. No one could be secured who could give information as to proper direction, name of villages or towns. Numerous villages were passed through not on the map. In addition to this a mile or so of line constructed in the wrong direction meant, perhaps, loss of material or, worse, loss of very valuable time. I found in following an army of this kind that every minute was most precious. The country was exceedingly level, and elevated points for observation never obtainable when wanted. It was impossible at critical moments to determine the whereabouts of the column. The entire army might be passing within 3 miles and be completely concealed in the exceptionally tall cane and corn, which grows in places over 20 feet in height. On this occasion we were completely at sea until I found a brick kiln from the top of which I was just able to see the tops of our wagon train some miles to the right. By watching the dust in that direction one could see the two roads would finally form a delta, so party continued on this line and reached camp before dark.

August 9 the detachment put in the hardest day's physical work of the entire trip. The heat since we landed from the transport was excessive, and on this day was something almost beyond endurance. The road taken leading from Tietsun to Hoshiwu was from 3 to 6 inches deep in dust and sand, and a very bad road at that. We were blocked off the road this day by transportation of other commands until 5 o'clock in the evening. Material had to be carried by hand and our saddle horses utilized as draft animals to help the carts over the bad roads by hitching ropes in the D rings and connecting to the front of the shafts. Two of the detachment were overcome by the heat and two of the laborers dropped dead. We reached the command on the outskirts of Hoshiwu between 8 and 9 p. m., everyone completely tired out and very much discouraged from the fact that the line was not working when we connected up. Found the trouble the following morning. Line had been cut but a short distance from the camp and several poles removed some 3 or 4 miles behind us. When these repairs were made things were in working order.

Left Hoshiwu on the 11th. The surrounding country was flooded this morning, it having rained in torrents, and for the first few miles we worked in mud and water up to our knees. Fortunately we ran out of the wet area, where the effects of the rain was hardly noticeable, and by hard work reached Matao about twenty minutes after the command had marched to Tungchow.

At Matao we were obliged to wait for the lighter to come up with more material. The winding detours in the river made the distance by water so much longer than the road in the last two marches that junks fell away behind the army.

The 12th was occupied by the party in extending the line toward Tungchow, using what little material remained. The line south being interrupted, myself and Sergeants Trotter and Akers returned to Matao (distance about 17 miles) to make repairs. Found line working when we reached Matao. Returned to Hoshiwu following day and had a skirmish with Boxers midway between stations, in which we were fortunately assisted by 6 men of the Japanese cavalry. I underestimated the strength of the enemy and found more Chinamen than we bargained for. The conduct of Sergeants Trotter and Akers is to be commended on this occasion. On account of the very long cane and corn the party became considerably scattered and every man was practically fighting on his own merits. The diligence displayed by these two noncommissioned officers in the performance of their duties has by far excelled that of any other members of the detachment, and their bearing on this occasion was by no means behind the performance of their other duties.

August 14 both men and animals began to show the effects of the work and extreme heat. The farther we proceeded the worse the roads became. Our lances were completely exhausted, and poles had to be secured by taking them out of houses and such means. Heavy poles were used for the most part from Matao on, and the work in consequence was much slower. We reached Changchwan that evening and camped on the south gate for the night. We were somewhat isolated on this occasion, being about 10 or 12 miles from Matao and 5 or 6 from Tungchow. Not being provided with an escort, the working party had to constitute the guard that night. We had several alarms, but nothing of importance happened.

On the evening of the 16th we reached the outskirts of Peking and camped by the east gate of the Tartar City. Our approach to the camp was somewhat interesting. We had no definite information that the Tartar City had fallen into the hands of the allied troops. Until quite late in the evening I was under the impression our road took us south of the south wall, which we knew would lead into the allied camps, but on closer scrutiny of the map I found it was the canal that ran past the southeast corner of the Tartar City, and the paved road which we were following went straight to

the east gate. We continued the march until it was too dark to go farther, and camped in the middle of the street in the midst of mud and filth, and glad we were to find a place to rest.

Our last box-sounding relay had been placed in Hoshiwu office and a pocket relay at Matao. A buzzer was used to Tungchow and telephone from Tungchow to Peking until we were able to get more buzzers from the lighter, when they were used also at Tungchow and Peking. This arrangement continued until more instruments arrived. Our original supply of instruments was eight box sounders. However, two or three got broken in transit, and their parts were used to fix up others that needed repairing. Quite a number of our instruments of various kinds, it is to be regretted, were found more or less damaged when they were opened, which had occurred in transportation. The glass fronts were all broken and spare glass parts were all of one size. Every telephone required more or less repair.

On August 17 the line was carried through Peking city to the American legation, and the first office installed there. This was the first field line of the allied forces to enter the city.

The work was trying in the extreme. Every man in the party had given up at one time or other with the exception of Sergeants Trotter and Akers. Had Peking been another day's march I don't know how we should have reached our destination. Several of the draft mules and ponies had to be abandoned, but we were generally fortunate enough to pick up others to replace them. Of the horses in the party all of them gave out except my own mount, and this horse probably covered more ground than any of them, but he was a lighter animal and better suited to the work. Even Lieutenant Loch's thoroughbred had to be left behind at Tungchow.

Of the difficulties encountered in maintaining communication on this hastily constructed field line the chief signal officer of the expedition is well aware. It is to be regretted that the unsettled state of affairs existing during the three or four weeks subsequent to our arrival in Peking prevented the immediate construction of a permanent line. The writer is of the opinion that all flying field lines of this kind should be constructed of suitable lances furnished for the purpose, a reserve stock of which should always be kept on hand; a light wire be used and a light porcelain insulator, this light line to be immediately followed by the permanent line, to be erected with iron poles. A suitable telescopic iron pole can be made to weigh not over 40 pounds and capable of carrying three wires without cross-arms. Much of the work of the corps in the Philippines consisted in connecting the various towns electrically, and in such work, where time is not such an important factor, the wooden poles answer as well or perhaps better than iron. Field lines at best will not stand any length of time without interruption even if not molested, and if interfered with by the enemy and the careless handling of transportation such as we met with here, and when it is remembered that any horse or mule can break a lance down by rubbing the flies off himself, the interruptions will be many and vexatious. This campaign has almost convinced me that a signal officer's stock of patience should be unlimited. He not only has to make the same day's march as anyone else, working every foot of the ground, but in addition has a wagon train of his own to look after, and when he reaches camp his day's work is only partially completed. To this may be added the very discouraging fact that when he connects up his instruments he is very likely to find the line is not working, from the fact that it has been cut behind him or knocked down by the worst enemy of field lines, viz, transportation.

While speaking on the subject of transportation, it is respectfully suggested that some provision be made in the near future that will provide the Signal Corps with their own transportation. I may be wrong in my statement, but it does seem to me that the tendency is to consider ordnance, medical supplies, and commissaries paramount to signal material. It is possible a man might live without signal supplies, but he might do the same without medical supplies or ordnance. Certain it is that the telegraph is about the first thing asked for, and the same can not be constructed without suitable transportation.

I beg to call attention to the fact that the Japanese entered Peking about a week after us with a very light line, one in striking contrast with our own, in which the contrast was very much in our favor. The Russians entered Peking on September 1. The Japanese used a very light copper wire and the Russians insulated cable from Hoshiwu to Peking, and from Tientsin to Hoshiwu they had line on poles.

The strength of the working parties was as follows:

The Japanese had 3 officers with working party, about 75 or 80 men, 20 very excellent carts they had brought with them, a number of pack animals, and plenty of Japanese coolies (the best coolies in the world).

The Russians had a telegraph force with their army here of over 200 enlisted men. Colonel Samoyeff, of the Russian general staff, one day at Tongku called my attention to the fact that 150 soldiers at that moment boarding the train for Tientsin were

purely telegraph men, enlisted for that purpose and nothing else. Before this detachment arrived, he informed me, he had 60 men already engaged on telegraph work. I met personally of the Russian force connected solely with telegraph service 1 colonel, 1 lieutenant-colonel, 1 captain, 4 lieutenants. I don't know how many others they may have had engaged on this work.

It can be seen that even our force combined with the British was greatly inferior numerically, and by the way, now that more British troops have arrived, their signal force is more than three times greater than ours.

Notwithstanding our small force, our line was the first into Peking, some days ahead of the other nations, and transacted an immense amount of business, including press messages and official business, for Americans, British, Germans, Russians, French, Austrian, Italian, Belgium, and the Netherlands. On August 25 and 26, in something over twenty-four hours, 524 messages were handled in the Peking office.

No sooner had orders been received at our headquarters relative to maintaining our troops in China for the winter than preparations were made to erect a permanent line for sole use of American people, and in compliance with instructions from the chief signal officer of the expedition I left Peking for Tientsin to get this work under way on September 6. Sergeant Trotter had collected a number of very good poles at Tungchow, which we had loaded on junks and distributed at the various posts on the river.

Lieutenant Hastings was placed in charge of the construction of the northern end of the line and Lieutenant Bartsch the section Hoshiwu to Tientsin. On October 3 the through permanent line—Peking to Tientsin—and the use of old field line given entirely to the British until such time as they could erect their own permanent wire. At present writing (October 22) they have only half finished this work, and it might be stated that their force of signalmen is far in excess of the United States signal force engaged here.

With reference to the consolidation of the two construction parties (American and British), I should make mention of the harmony that characterized the work of the party. Lieutenant Loch, Royal Engineers, an indefatigable worker, was ever ready to accept any instructions and directions and to act upon them with willingness and dispatch. Sergeant Trotter, as senior noncommissioned officer of the party, always met with same prompt obedience from the British noncommissioned officers and men as he did from his own. This class of men in the British army, as their officers voluntarily admitted to me on a number of occasions, are by no means endowed with the same standard of intelligence as the Signal Corps men of our service. The British officers were quick to recognize that fact. Their operators know little or nothing about the laws of the current, are never called upon to construct or repair lines, or perform visual signaling, while we expect our men to take a hand, if need be, at all three, as they should if the occasion demands. The sudden emergency that necessitated the operations of American troops in China has very forcibly demonstrated the need of trained signalmen who can be relied upon to perform any of the duties pertaining to that branch of the service. It is to be regretted that the urgent demands on the Signal Corps prevent the thorough training of men before being sent to service or on stations. Even for the service herein described the chief signal officer, Division of the Philippines, was called upon to supply from his small force the men and supplies for this campaign.

The traffic on the line developed such magnitude as to necessitate the issuance of an order on September 2 declining acceptance of all press, private, and business for troops of other nations, the cable company likewise being compelled to decline press and private business in order to enable them to handle the business of the allied forces.

The delay of cable dispatches from the United States to Peking, and vice versa, has been the subject of much comment before the completion of the cable by the cable company from Shanghai to Taku, which delay seems to have been charged wholly or in part to the service of our telegraph line. As is to be expected on a field telegraph line, delays and interruptions did occur; however, the facts connected with the routing of the messages seem to have been entirely lost sight of, viz, any message filed at Peking for the United States after reaching Taku had to be sent to the flagship, 12 miles out to the anchorage. Owing to the great demand for water transportation (tugs and launches) required to disembark troops and supplies, a boat could not be specially assigned to this work; consequently the messages went by the first available opportunity. It should be remembered that the nations were all assisting each other in the matter of water transportation to bring their troops and supplies ashore. So that a message arriving in Taku one day might reach the flagship that day and it might be the next. From the flagship they were forwarded to Chefoo by the first gunboat sailing for that port; thence by Chinese land line (a line practically in the hands of the enemy) to Shanghai. There is hardly any means of estimating the delays that

may have been occasioned on this line. I was reliably informed that this line was frequently "down," very much overcrowded, and operated by Chinese operators. It is safe to say—in fact, I am positive—our own men were the fastest operators handling business pertaining to the operations of this campaign, and if our operators were overcrowded with work for the line it can readily be imagined what was the state of affairs on the Chinese line, where they used antiquated tape registering machines. From Shanghai the messages were forwarded by the Great Northern Telegraph Company, which at the time was in trouble from an intermittent fault that the company had the greatest trouble in locating. Until about September 11 these cables were transmitted by Chinese operators, and, to use the superintendent's words, "the errors made by these men would drive a man to drink or insane."

STATIONS IN OPERATION.

The following stations were established:

On south end, Taku, Tongku, and Tientsin.

On north end, Tientsin, Pietsang, Yangtsun, Hoshiwu, Matao, Tungchow and Pekin.

The south end of the line, as previously stated, was erected and operated entirely by the Signal Corps, United States Army; the north end erected and operated in conjunction with the British until the completion of our own permanent line. As two offices were established at Tientsin, one the original office in the Signal Corps quarters and one at the Sixth Cavalry camp, it can be seen we had ten stations in operation, all the stations doing considerable business.

With the exception of Pietsang, these offices are still maintained by the Signal Corps, but principally for repair stations. Our troops have already been withdrawn from Yangtsun and Hoshiwu, these places being garrisoned by troops of other nations. It is understood the intention is to withdraw our troops from all stations excepting Tientsin and Pekin.

VARIOUS EQUIPMENTS.

It is noticed that all foreign troops make use of the open-circuit, high-resistance instruments in connection with their telegraph service in contrast to the instruments of low resistance used by us. There is, however, no doubt as to the superiority of the American instruments over those used by the other troops. The chief of the Russian lines of communication informed me he well knew the American to be the best in the world, and our system one he wished could be adopted by them. A radical change like this, however, would take much time in his country, he stated, and for their military service it would be next to impossible to secure sound-reading operators. I believe they had but one sound-reading operator, and his knowledge was acquired in the United States. The extreme sensitiveness of the high-resistance instruments give some advantages, requiring less battery power and giving results that could not be obtained with ours on a very faulty line; but any advantage of this kind is counterbalanced by the fact that they are almost useless on a line where there is more than one station. With their open circuit two stations can not work at one time, and they will not give even fair results when so arranged that all stations are cut in.

The writer has noticed, particularly in the work of the Signal Corps here and in the Philippines, the difficulty encountered in operating lines that are more or less faulty. And hastily constructed lines, by the way, can be considered such until placed on a permanent footing. With our box and main line sounder the armatures are entirely too heavy to respond to very weak currents; even our ordinary relay with local sounder will give very good results on a line that with box-sounding relays will be found almost impossible to work. As these heavy armatured instruments are rarely used in America but for short lines (well constructed) and on loops, the adoption of a more suitable instrument for our work is suggested. The Russians and English have the complete set of instruments mounted on a baseboard. With the Russians it is large and awkward, the English somewhat lighter; but with our instruments a suitable arrangement could be made to mount the set in little space, the whole encased in suitable box and thus made portable. The advantage derived from this, I think, would amply pay for the cost. When an operator is placed on station with a box relay the first thing he makes request for, if he knows anything about operating, is a set of instruments consisting of relay, key, and sounder.

With the British service the office equipment and repairmen's kits were put up in a manner that might be well taken note of. The office equipment, consisting of instruments, blanks, stationery, office clock, office wire, small pliers, and in fact everything that would fit an office out for some months, was packed in a small box. This

box does not require much room for transportation, and when left at an office one can feel assured the office has a full equipment.

The repairman's kit, consists of heavy pliers, come-alongs, two-joint digging bar, connectors, a quantity of tape; the whole done up in strong canvas bag. Both these arrangements go far to reducing the percentage of loss of tools, from which we seem to suffer in our service.

The Japanese constructed their line with a No. 16 copper wire.

For field service the Russians use a No. 16 G. I. wire.

The Germans have no field line at present, having secured their line at great cost by contract with private party, and the French have no line at all.

The British use a No. 11 G. I. wire for the field and permanent lines.

The galvanized-iron pole used by the British was the only specially constructed telegraph pole noticed in use. In view of any further purchases by the Signal Corps of iron poles the design of this pole might well be considered. This is their standard military telegraph pole, is made of galvanized iron, is telescopic, weighs about 40 pounds, is about 20 feet high and capable of carrying three wires. It would make an excellent pole for quick construction of permanent lines, or lines that it is intended to replace with wooden poles; the iron ones could then be used for future work.

The Russians, British, and Japanese use about the same style of hard-rubber insulator for their field work. This is not of the petticoat pattern, is 3 inches in length, 1 inch diameter at top and $1\frac{1}{4}$ inches at the base, is somewhat lighter than ours, and requires less cubic space to pack.

In conclusion, I desire to state that I will secure, if possible, a sample of the various equipment and forward same for future reference.

EXTRACTS FROM REPORT OF SECOND LIEUT. PETER BARTSCH, SIGNAL OFFICER OF VOLUNTEERS, ON OPERATIONS OF SIGNAL CORPS IN CHINA.

SIGNAL OFFICE,
Tientsin, China, November 1, 1900.

In compliance with orders from Major-General Chaffee, commanding the expedition, the Signal Corps detachment under my command, consisting of Lieut. C. O. Hastings, signal officer, United States Volunteers, and 7 enlisted men, and which embarked on the U. S. army transport *Grant* at San Francisco, Cal., on July 1, 1900, under orders to proceed to Manila, was landed at Tongku, China, on August 1, 1900, for service in China with the expedition under General Chaffee.

On July 31 Maj. George P. Scriven, Signal Corps, United States Army, arrived on the U. S. army transport *Wyefield* from Manila. Upon his first visit to the transport *Grant* I reported myself and detachment to him for instructions, which were to expedite the unloading of all signal stores from the *Grant* and then to proceed to Tientsin. The stores, which consisted of lances, wire, and insulators, having been transferred to a lighter and turned over to the quartermaster's department for shipment to Tientsin, I proceeded and arrived, in company with Major Scriven, at Tientsin August 1.

Orders for the advance of the army were then already in course of preparation, and upon their promulgation I received orders from the chief signal officer of the expedition to take station at Tientsin and assume charge of the then already established United States military telegraph line from Tongku to Tientsin.

Upon the departure of the Signal Corps detachment, designated for the advance with the army on Pekin, I found myself, on account of the very small available force, with only one good operator to handle the daily increasing traffic between Tientsin and Tongku, and also for work with the advancing army. Two men who were left with me as linemen were recruits and entirely unacquainted with line telegraph and signal work.

As the stores which I had turned over to the quartermaster's department at Tongku for transportation to Tientsin had not arrived when the army was ready to advance (the lighter conveying the stores having run onto a sand bar and thereby being delayed for several days), and also for want of sufficient transportation, arrangements had been made by the chief signal officer, prior to his departure from Tientsin for the field, by which the line constructed with the advancing army was operated jointly with the British telegraph department. The force left by them consisted of three operators.

The then-existing line from Tongku to Tientsin had been built by Lieutenant Stamford, Signal Corps, United States Volunteers, who landed in China with the

first expedition from Manila. It was erected along the railroad the entire distance, until it diverged and entered the European section of the city of Tientsin through a cable in the Peiho River.

Upon my first arrival at Tientsin I was informed by Lieutenant Stamford that trouble existed on the line, which I found upon investigation to be caused by a leak in the cable used. As no other cable was available, of which I knew, I improvised one by using weatherproof insulated copper wire, heavily weighted. This expedient lasted sometimes for a week, then again only for a day or two, or even for a few hours only, because the wire would become damaged or be cut entirely, so as to leak, by poles used by boatmen for the propulsion of their junks up and down stream. When replacing these improvised cables I had the line, for the time being, continued over a pontoon bridge, but this arrangement for permanent use was impracticable, for the reason that the bridge was frequently opened to permit the passing of boats.

But with all these frequent interruptions communication between Tongku and Tientsin was at no time longer delayed than three hours, and then by the line being grounded, caused by the breaking of lance poles.

With the line constructed with the advance army conditions were less satisfactory, for not only did the line pass through a cable in one of the branches of the Peiho River, giving the same kind of trouble as on the Tongku section, already mentioned, but had to, of necessity, be built through the walled city of Tientsin, where its route lay through a city hostile to anything foreign. Interruptions caused by the cutting of the line were many, though not more than was expected in this district.

As the distance of the advancing army increased, so also increased the frequency of trouble in telegraphic communication with the advance.

The line was built on the west side of the Peiho River until it crossed to the east side at Peitsang, about 8 miles north of Tientsin; for this distance fairly good protection was afforded by outposts and pickets stationed for this distance for the protection of Tientsin. After the line passed Peitsang it was frequently cut, and even sections of it carried away; at one time about a mile was taken. As the line was built through cornfields and other high vegetation, this was easily accomplished, especially so as the line was not patrolled by troops other than repair parties, who on several occasions were fired on and driven back by the Chinese.

With the advance of the army interruptions like the foregoing became more serious and annoying, for delays meant an accumulation of traffic, which at this time had assumed great proportions, handling as we did messages for all of the allied forces, the Japanese excepted. While the latter and the Russians had also lines constructed with their advancing armies, it appeared that ours, with all its troubles, was the only one which was able to serve and accommodate them all; a fact which certainly was appreciated by all concerned, and many were the complimentary remarks made by foreign officers, and civilians as well, about the able and efficient service which the United States Signal Corps was rendering under such adverse conditions.

Arrangements, which offered of no alternative, for the transmission of cablegrams to Chefoo had previously been made and were as follows: Cablegrams were received at Tongku over our line, then taken by tug or launch to the U. S. flagship *Brooklyn*, anchored in Tongku Bay, about 14 miles from Tongku village, the terminal of the railroad. From the *Brooklyn* a dispatch boat took daily all cablegrams to Chefoo, at which place they were turned over to the land lines, extending to Shanghai, thence by cable to their different destinations.

While the handling of cablegrams by tugs and dispatch boats may not have been the most expeditious method, they proved themselves, as already stated, the only available means of forwarding or receiving such, and were, as investigation proved, more secure and expeditious than the Shanghai land line. On this line messages were often delayed for days, for causes unexplained. Perhaps it was great rush of business, or it may have been, as the company (so I am informed) was under Chinese control, their idea of rendering service to their country by delaying work for the foreign nations; be this as it may, cablegrams are on file at Tongku twenty days from London and nineteen days from New York.

It will thus be seen that the most prolonged and vexatious delays in the transmission of messages were consequent upon conditions over which the Signal Corps had no control, and while delays did occur on our land line, due to unavoidable causes, already set forth, their nature was mostly such as must be expected when a telegraph line passes through territory (and dwindle into insignificance when compared with delays attributable to a service in foreign) in the enemy's hands.

Very unsatisfactory conditions often prevailed on our line from Tientsin to Peking, due to the fact that the British operators employed on this section were, without any exception, as far as I know, strangers to and unaccustomed to our system of telegraphy; all of them devoid even of the most rudimentary electrical knowledge, it is

easy to understand that the adjustment of our relays was a specially difficult feat for them, and many times they were unable to work them for this reason.

To show their utter lack of electrical knowledge I may cite one case, which came to my notice at Yangtsun, where, arriving without previous notice, I found that the operator had, with all good intentions, given up the adjusting of his relay and connected his open-circuit instrument to the line, and was endeavoring to thus work with our closed-circuit system and with reversed poles of batteries.

At another station (Hoshiwu) I found a dry battery connected onto the main line, likewise with reversed poles, in series, with a gravity battery.

Besides the interruption caused by these—to them justified trials, “to see if they could not make the line work”—were the useless trips of linemen and cavalry patrols, after the latter had been established, in their endeavors to find trouble on the line.

While the intentions were that the British and our work should be handled with justice to both, the fact that their operators were in control, at several important points, of the keys gave them an opportunity of which they at times took a guarded advantage.

While as a rule our operators are possessed of more intelligence than the British operators which I have met, I much regret to say that even their stock of electrical knowledge proved itself on many occasions very limited.

Unavoidable and under the circumstances enforced delay of traffic was also caused—as delays always are at repeating stations—on the line near Pekin for the want of sufficient instruments and battery materials. This procedure, viz, relaying, might have been avoided had my request for these identical supplies met the approval of the acting chief signal officer of the Department of California prior to my sailing from San Francisco on the *Grant* with the troops destined for operations in China. Under the circumstances I thought it possible that the occasion might arise, as it did, when the telegraph supplies, minus instruments and battery, already on-board the *Grant* could be used to good advantage with the then sailing army in conjunction with the army already in China, or in the event the command would of necessity operate by itself; but, as stated, my request was not granted, much to the detriment of our future operations here.

All conditions which at different periods were conducive to delay of traffic over the lines, both cable and land, have since been eliminated by the extension of a cable direct from Shanghai to Taku, situated on the west bank, at the mouth of the Peiho River, 40 miles distant from Tientsin, and in direct connection with our Pekin land line. The latter has also been rebuilt, and is giving now excellent service from Pekin direct to Tongku.

In order to improve the service between Tongku and Taku, on opposite banks of the Peiho River, I obtained, after the Shanghai cable had been completed, through the courtesy of the Russian admiral, about one-half mile of 1-inch armored deep-sea cable, and laid the same with the intention of extending our land line through same direct to the cable office, and thereby to discontinue the using of boats for the conveying of messages across the river; but the newly laid cable lasted only one night. It was cut by the propeller of some passing steamer. Another cable, not as strong, which I secured from the British naval service, met a like fate. Since then messages are carried from our terminal office at the mouth of the river, about 2 miles below Tongku, to the cable office at Taku, across the river, and these conditions must prevail until we secure a suitable armored cable. The Peiho River is shallow and swift, which makes the maintenance of a cable through same very difficult.

I continued on duty at Tientsin until August 23, when, in obedience to instructions from the chief signal officer of the expedition, I proceeded and took station at Yangtsun, 21 miles north of Tientsin. Here I remained on duty until September 10, when I received orders for the rebuilding of the telegraph line from Hoshiwu to Tientsin. This work, with the very small force—Corporal Arnett and one private and a number of Chinese coolies—at my command, and subsequent delays, such as waiting the arrival of material and transportation, was accomplished on October 17.

Our line from Tientsin to Yangtsun is strung on iron poles erected along the railroad and owned by the British.

From Yangtsun to Hoshiwu it is erected on wooden poles, poles varying in size from 6 to 9 inches at the base to from 3 to 7 inches on top, and are on an average about 16 feet above the ground. The brackets are nailed and tied to the poles with wire, thus making them doubly secure. It is safe to assume that the line from Tientsin to Hoshiwu as now constructed should, under ordinary conditions, remain, if so desired, in constant operation for at least a year, provided climatic conditions during the winter in this country are not materially different than they are in the States in like latitude.

Trouble from cable interruptions through the Peiho River at Tientsin may also be considered as overcome, for we have obtained from the German telegraph department two conductors, through a very heavily armored river cable, which has so far stood, and promises to stand all wear and tear which the heavy boat travel on the Peiho River in summer and floating ice during the spring subject it to for a long time.

From observations of incidents as they have come to my notice since serving here in China, it seems to me that a larger signal corps and one more independent of other organizations and departments is almost if not absolutely necessary for public service.

The number of men for duty with the corps should at all times be sufficiently large and backed by a reserve, so that when called upon for active service a suitable, trained, and skilled force, so very essential in our branch of the service, be available—trained and skilled, because a man even if available and not so is worse than no man at all—for by those not versed with the conditions and requirements of members of the Signal Corps the corps will be credited with a certain number of men, and consequently so much work will be expected to be done by it. And where and in what other branch of the combative service is individual, technical, and practical experience and knowledge so essential and absolutely necessary to accomplish the end as in a Signal Corps man, working under so many variable conditions—especially on field telegraph lines subject to numerous changeable conditions.

Men before being assigned to duty should be trained soldiers and versed at least in all minor electrical branches, especially such as pertain to a telegraph line. It is not unfair to assume that one-half of our operators, even if gilt edge at sending and receiving the Morse code, could not describe the working of an ordinary telegraph relay and the different adjustments of the same. All these requirements can not be acquired by even the most intelligent young man in less than a year's course of training and study at some Signal Corps school, and even then good linemen must have the experience before satisfactory work in their line of service can be expected of them.

The matter of transportation is, in my opinion, and as events proved during the war, equally as important as a larger and trained enlisted force. It suggests itself to me that the Signal Corps should be independent for transportation, in all its details, from the Quartermaster's Department, for while no discrimination may intentionally be perpetrated, it may, in the rush and turmoil of active war preparation, nevertheless occur, and the expeditious handling and transporting of—when not actually needed—insignificant lance poles and wire be considered a secondary issue, as was the case in point with the unloading and transportation of the telegraph supplies from the transport *Grant*, which was not done until almost the last, and not until explicit orders from the general commanding the expedition were received; but unfortunately the delay which did occur before this was done, was the principal cause for the supplies not reaching Tientsin in time to become available for use with the advancing army.

In conclusion, I beg to invite the attention of the chief signal officer to the following-named enlisted men, who, by their close application to their duty when operating the Tongku and Tientsin section during its busiest period, proved themselves good workers for the interest of the service, viz: First-Class Sergt. Harry E. Courtright, Sergt. John McDonald, at Tongku, and Corpl. Fred Yandean, at Tientsin. The last named noncommissioned officer handled all traffic which passed through Tientsin. This compelled him to often operate incessantly from 6 a. m. to 11.30 and 12 p. m., and he is deserving of recognition for his good work.

Corpl. Charles E. Arnett, who was, while rebuilding the telegraph line from Tientsin to Hoshiwu, under my direct supervision, deserves mention for his faithful application to the work in which he was engaged. He proved himself a reliable and trustworthy noncommissioned officer in every respect and merits promotion.

EXTRACTS FROM REPORT OF SECOND LIEUT. CHARLES O. HASTINGS, SIGNAL OFFICER OF VOLUNTEERS, ON OPERATIONS OF SIGNAL CORPS IN CHINA.

OFFICE OF THE CHIEF SIGNAL OFFICER,
Pekin, China, October 17, 1900.

In compliance with telegraphic instructions from the commanding general, Chinese relief expedition, dated July 30, 1900, I landed from the transport *Grant* on the afternoon of July 31, 1900, at Taku (mouth of the Peiho River), and reported by wire to Lieut. W. H. Stamford, signal officer, United States Volunteers, the acting

chief signal officer of the expedition, and next day, August 1, 1900, proceeded by rail to Tientsin and reported in person to the above officer, who assigned me to duty with the expedition, and I immediately began preparations for the field. In connection with this duty it is thought proper to state that the corps was unable to obtain transportation for its equipment and other supplies, and had to leave for the front with such carts and native mules as could be picked up in the city. I had one cart for the rations, and bedding of Lieutenant Stamford and self, and our riding horses had to depend on the country, as we had no means of transporting forage for them. On this one cart there were also placed line material and other items. With the above transportation I left the city on the afternoon on August 4, 1900, and marched to the camp of the signal corps construction party which had already carried the field line to the most advanced outpost of the allies beyond the walled city of Tientsin. In the evening of this date I reported to Maj. G. P. Scriven, United States Volunteers, who had superseded Lieutenant Stamford as chief signal officer of the expedition, with three signalmen for duty, and by his direction camped near the headquarters of the commanding general to be in readiness for any calls upon our corps. Three British signalmen were also attached to our party in order to be available for communication with the English in case it became necessary.

At 3 a. m., August 5, moved out with my party, accompanying headquarters, and was present during the fighting of this date at Peitsang. The condition of the country was such that flag signaling was impossible, even had it been called for, and being called upon for the duty, acted as aide for the commanding general. I continued on this duty for the following three days, taking part in the battle at Yangtsun on the 6th.

On the 8th of August, the field line not working satisfactorily, I was sent back with dispatches and also to find and correct the fault on the line. Leaving Peitsang at 6 a. m. with an escort of two Bengal lancers I rode to Yangtsun, inspecting and testing the line, but found no fault until I had reached the office in that village, where it was discovered that the operator, through ignorance, had cut off the north by replacing a ground on that side of his instrument. This corrected, three messages were sent and then the line opened again. As the messages to be forwarded were the important cipher dispatches from the minister at Peking, and it was necessary to get them to Tientsin for interpretation, I rode to the next field station on the line at Peitsang, and sent them by wire from there. The line was found to be disconnected twice between these stations (Yangtsun and Peitsang), one a clean cut and the other a break. On the 10th I returned to the front, riding about 32 miles, following the line, testing and making temporary repairs where lances had been broken and displaced by trains and pack animals. Camped for the night (August 10) about 14 miles north of Yangtsun. The line had then been carried forward to Hoshiwu, and was in working order to that point when I passed, about 9 a. m., August 11th. Rejoined the command at camp at Chaingshiwan about 9 p. m. and continued with headquarters until after the capture of the city of Peking on the 14th, taking part in the action of that date.

Under orders of the chief signal officer of the expedition, I left Peking on the morning of the 15th, with an escort of 14 men, carrying dispatches to the end of the field line, which I found at Tungchow, 15 miles from Peking. From here I rode to Hoshiwu, inspecting and repairing the line. Great difficulty was found in maintaining communication, owing to the frequency with which the line was broken and cut and the want of patrols for its protection. From this duty I returned to Peking on the 19th of August.

On the 20th of August took station at Tungchow by order of the chief signal officer, and assumed charge of the field line from that station to Hoshiwu. My party consisted of two signalmen and three coolies. This force was further increased by two Madras linemen from the Royal engineers (British). With a guard from the American troops stationed along the river, the work of repairing, rebuilding, and caring for the line from Tungchow to Hoshiwu—45 miles—was taken up, and all of the section between Matao and Hoshiwu was rebuilt (that is, raised from the ground and the route changed in several places to avoid localities where it was liable to be interfered with). Both of the signalmen who were with me were taken sick and the work was carried on for some days with the coolies and the Madras linemen. This duty of repair work and line work generally was continued until the 10th of September, when a permanent line was commenced and my party was joined to a larger one sent from Peking, the whole force being placed under my direction, for line construction.

As an incident of how much the breaks and cuts interfered with the business on the lance or field line, I wish to state that upon going down the line (August 21) I found one or two breaks and cuts—one was a clear cut and one doubtful—between Tungchow and Matao, and after these were repaired the line was again

cut before I could ride in to the station, about 5 miles. There were also several broken lances, which allowed the wire to touch the growing vegetation, causing partial grounds. Those broken poles were traceable in this case to the Russian cart trains. And it is thought desirable to say at this point that fully one-half of the interruptions on this portion of the field line were caused by the Russian troops. These people did not in a single known instance repair a break caused by them, and I found the tracks of Russian soldiers near one of their outposts at a cut on the line, showing that they had been caught by the wire lying on the ground and cut it to clear themselves from the entanglement. It was officially reported by Captain Mullen, of the British royal marines, commandant at Hoshiwu, that by order of a Russian officer the line was cut at one of their camps to facilitate the passage of the carts from the road to the camp ground, and then coiled and placed at the side of the road and left in that position all night, and remained so until the linemen from Hoshiwu found it the next morning. These are only one or two instances of the many aggravating cases of the kind. After the system of patrols was inaugurated, in the latter part of August, matters were not quite so bad, but north of Hoshiwu the patrols were taken from the Bengal Lancers, none of whom understood the splicing of a wire. They would find a break in the line and then ride back to their station and report. This would always mean three or four hours' delay at the least. Some of the linemen would not ride (Madras linemen), and this further delayed business. I had all of the patrols instructed in making a splice, but this did not always work to our advantage, as is shown by the fact that one of these patrols, after finding a cut and making a splice, buried the bare wire in the ground so (as he reported) it would not be again disturbed. Some of the native East Indian linemen could not be trusted to be sent on a repair trip, for it was reported on several occasions that they only went out a mile or so, then sat down and rested and returned to their station. This was another feature of the trouble, and it lasted longest. The interruptions which I would class as purely Chinese occurred on my section of the line most frequently near Hoshiwu. These interruptions took the form of cuts, removals of portions of the wire, and the carrying off of lances, especially the wooden ones. To lessen this trouble I cut out the portion of the line which ran through the back villages near this station (Hoshiwu) and rebuilt along the main road for about 4 miles north. This removed a great deal of this cause of interruption. South of Hoshiwu the interruptions were not so frequent (as far down as Yangtsun), owing to the line being raised on poles and running for the most part at quite a distance from the main road, thus lessening the chances of breaks from carts and passing troops. There were no escorts for the linemen at this station, and Private Burke, of the Signal Corps, made several trips on this duty without escort at a time when it was not considered safe for small parties to travel the road.

Between August 28 and September 3 the line from Matao to Hoshiwu was raised from the ground and placed on lances. This lessened but did not remove the vexatious delays and poor service on the line, for by this time there had been so many bad splices made that the resistance of the wire was too great for the battery power to overcome.

The permanent line was started on the 9th of September, and the section from Hoshiwu to Matao completed on the 12th. On the 13th this section was cut in on the field line, and the service was from this time on practically free from great faults traceable directly to the line itself. The working party was fired upon by the Chinese at a small village near Matao on the 10th of September. No casualties.

There was some delay in the work owing to the nonarrival of material, but the line was completed through to Tungchow on the 30th of September and to Peking on the 4th of October. This has been practically the end of trouble on the line.

Owing to a scarcity of operators in our corps and to a scarcity of instruments with the Royal engineer telegraph corps, the work at the offices, until the arrival of more American operators, was done at all of the stations on my section by British operators, using American instruments. As these men are trained in the use of open-circuit instruments, they were ignorant concerning the adjustment and care of our relays, and many delays are traceable to the fact that these operators could not adjust so as to work with a weak or variable current. Although in nearly every case that came under my notice the men were willing and ready to work night and day, they could not do as good work under these circumstances as our men would have done, or as they would have done with their own instruments.

The following observations as to methods of construction and operation, together with remarks on material used by the different nations on field telegraph lines, may be of interest:

The Russian field line was erected on lances halfway from Tientsin to Peking, and the remainder was constructed of a heavy cable, which was taken from the arsenal at

Tientsin and can not be considered as a part of the regular field equipment. The construction party of the Russian telegraph corps consisted of about 100 men. Their transportation was the ordinary Russian cart, supplemented by a large number of Chinese carts. The wire for the overhead lines was a smaller size than that used by our corps and was paid out from a wooden reel somewhat resembling ours in construction. Their lances are of fir and about the same length as that of the other armies, and their insulators are of a large porcelain variety, fitting on a spike at the top of the lance and on an angle iron when used on heavy poles or trees. The lances are planted about 10 inches or a foot in the ground, and supported by a wedge of wood on each side at right angles to the direction of the line. The party worked slowly and was several days behind the American line. The field battery of the Russians consists of glass jars, carrying a porous cup with copper and zinc elements. It offers no advantage over our own. Judging from the amount of battery power used, it is thought that its power is about the same as the ordinary gravity cell.

The Russians, as well as the Japanese, use the tape-recording instrument.

The Japanese field line was constructed of No. 14 copper wire, erected on light wood lances or bamboos. They use hard-rubber insulators. Their construction corps was a large and fully equipped force, but their line was not built with much care and soon gave way to the strain of wind and storms. I see nothing in either of these nations in the way of line construction that we need to copy.

For want of proper transportation, our work, both in the matter of erecting and keeping in repair the field line, was greatly hampered. The Chinese carts and mules which were finally obtained along the road were small and illy adapted to carrying loads of any amount. It was rarely that over 150 or 200 pounds could be carried on one cart. However, many coolies were available, and their labor was largely utilized. In the construction of the new line two carts were coupled together and the mules driven in tandem. By this means quite a respectable load of poles was hauled (about 20 on a double cart). In all of the work only one four-mule wagon was furnished the corps by the Quartermaster's Department, and this joined the construction party in a crippled condition—one of the mules missing—and it was used in this condition until the 1st of October.

I wish to recommend for consideration First-Class Sergt. Charles H. Trotter and First-Class Private John L. Headington, Signal Corps, United States Army, for efficient work and willingness under all conditions arising during the time they were with me on the line. Their resourcefulness and thorough manner of doing work contributed greatly to the success of the corps' labors.

EXTRACTS FROM REPORT OF SECOND LIEUT. H. W. CAPRON, SIGNAL OFFICER OF VOLUNTEERS, ON OPERATIONS OF SIGNAL CORPS IN CHINA.

SIGNAL OFFICE,
Tongku, China, November 4, 1900.

On September 17, 1900, I was placed in charge of the section of United States military telegraph line between Tientsin and Taku.

September 26 the cable across the river at Tongku was carried away, probably by a large steamer going up the river, and part of land line destroyed. The cable was recovered and found to have been cut in two. An attempt was made to splice the break, but with the materials at my disposal this was found to be impossible.

Permission was obtained from the British officer commanding the northwest fort, directly across the river from the Joint Cable Company's office, to place an American operator in the fort, messages to be delivered at the cable company's office by boat, which made trips at least every hour. Although 95 per cent of the business transferred to the cable company was British Government, this permission was obtained only with the greatest difficulty.

On October 4, another cable having been obtained and laid a few hundred yards below the fort, communication was again established with our office in Taku. This cable was operated two days, when it suffered the same fate as the one on September 26, necessitating the reopening of an office in the northwest fort. As a further supply of cable could not be obtained in China, I was compelled to await the arrival of cable from Manila, in the meantime transferring cablegrams to the cable company by boat, as mentioned previously.

On October 21 I received orders from Lieutenant Stamford to rebuild the land line between a point 2 miles north of Ching Lung Chang and Tientsin, crossing the

Peiho river through a large two-conductor cable Lieutenant Bartsch had secured from the German authorities.

I immediately set about preparations for this work, and October 22 a party, consisting of three signal men and fifteen Chinamen, in charge of Corporal Yates, started the reconstruction work. October 29 the work was completed as far as the old line followed the railroad, or a distance of about 15 miles.

Sergeant Trotter and a party from the north section joined Corporal Yates this date and took charge of the work, Corporal Yates being ordered to Tongku as lineman.

November 2 the Tientsin-Tongku section was completed.

On the morning of October 30, cable having been received from Manila, preparations were at once commenced to lay the same, and at the present time everything is in readiness for the work, but owing to the high winds prevailing it is not thought best to attempt it.

Early this morning all Signal Corps property at Tongku intended for shipment to Tientsin had been loaded.

APPENDIX No. 6.

EXTRACTS FROM REPORT OF CAPT. OTTO A. NESMITH, SIGNAL CORPS, ON MILITARY TELEGRAPH LINES IN CUBA.

JULY 31, 1901.

TELEGRAPH CONSTRUCTION AND BETTERMENT.

While the net increase in mileage of lines, including the Cape Maisi telephone line and deducting length of the old line between Guantanamo and Sagua de Tanamo, has been but 162 miles, making the present mileage 3,418 miles as against 3,256 of the previous year (the present condition and all changes in the lines being shown in the map which accompanies this report and forms Appendix A, while the map showing present condition and changes in circuit forms Appendix B), and the absolutely new construction work for the year was practically confined to the lines between Habana and Quemados via Columbia Barracks, between Guaracabulla and Trinidad, and between Guantanamo and Sagua de Tanamo to Baracoa, the last begun but not completed during the fiscal year, much reconstruction work that is treated in detail below was of such a character as to merit being denominated new work.

The Guaracabulla-Trinidad line, 51 miles in length, was primarily projected and determined upon as a line to connect Trinidad and Fomento, in the province of Santa Clara, upon the solicitation of the civil governor and the officials of the province, for the purpose of opening up the commercial and agricultural interests of the rich Fomento Valley and of the important sections lying along the proposed line, that were showing signs of returning prosperity and which it was expected would be greatly benefited by the improved means of communication.

The original understanding was that the right of way and necessary poles would be donated by interested parties free of expense to the Government, while the balance of the material and the labor would be supplied by the Signal Corps, and upon this understanding an estimate was made and the expenditure approved, and arrangements for construction begun, when the plan was enlarged to extend the line from Fomento to Guaracabulla, where connection would be made with the main line on the north.

There was already an old Spanish line running from Trinidad to Casilda, on the south coast, so that the new line from Guaracabulla through Fomento to Trinidad would have connection with our trunk line on the north and give practically a new connection on the south coast with the Cuba submarine cable at Casilda.

The work determined upon and all necessary arrangements for pushing it made, it was discovered that the promises as to delivery of the poles where needed free of expense to the Government would not be carried out, the parties who were to so donate them according to the original agreement denying any such offer and claiming that all that was ever intended was permission for the Government to cut the timber and haul the poles to the points needed at its own expense—practically the cost of the poles. So that in the end no assistance was received from outside parties, the poles being purchased under contract, the other material being supplied by the Government, and the work done by the Signal Corps, the Government being compelled to bear the entire expense, which, owing to the failure of the interested parties to carry out their agreement, the enlargement of the original plan so as to extend the line from Trinidad to Guaracabulla, and difficulties of construction encountered, was

increased from the original appropriation of \$2,500 to over \$5,000 for poles and labor alone. The actual cost of the line, including all material, was \$6,092.51—a very reasonable sum when the character of the work and the difficulties of transportation are considered. The entire line was built of best hard-wood poles, sunk, regardless of amount of work required, to a uniform depth of 4 feet, while only the best No. 9 iron wire was used in the construction. The material had to be transported almost entirely, with the exception of the poles, by pack train, while for over 17 miles of the line there were but trails, over which poles had to be dragged one at a time, and about one-fifth of the line required blasting of holes before poles could be set. This experience, however, had one good result in being an excellent object lesson to the Signal Corps, as it demonstrated the necessity for leaving out of consideration all assurances of assistance from communities demanding improved telegraph facilities and of estimating for the entire cost of any undertaking before approving the scheme.

In connection with improvements in the city of Habana, which consisted of the reconstruction of the main telegraph line within the city limits, rendered necessary by interruptions caused by construction work of the Habana electric railway, the line, 7 miles in length, of eight No. 14 wires, connecting headquarters with Camp Columbia and Quemados, was built, which, primarily intended to secure telegraph and telephone connection between the military governor's palace and Quemados in case it became necessary to move headquarters during the season of sickness, has proved of the greatest value as the permanent telephone line in connection with the city military system.

The line from Guantanamo to Sagua de Tanamo and Guantanamo to Baracoa demanding such extensive repairs as to amount to rebuilding, a new line was determined upon which should run from Guantanamo to Sagua de Tanamo, a distance of 50 miles, and thence to Baracoa, a distance of about 70 miles, the former a new line following substantially the old and the latter a new outlet, shorter than the present one between Guantanamo and Baracoa, and one that will be much easier to maintain, and permitting the abandonment of the old line, which ran in such proximity to the sea that the wire soon suffered injury, and through such a wild and mountainous country as to give the service constant and almost insurmountable trouble. The contract for the labor and poles (the balance of the material being supplied by the Signal Corps) of the Guantanamo, Sagua, and Baracoa line was, after due advertisement, awarded, under \$1,000 bond of liquidated, damages, to Mr. J. W. Grace at \$110 per mile, payment to be made after completion, inspection tion by representative of the Signal Corps, and acceptance.

The contract was signed the 12th day of March, and required that the entire line should be completed within three months from that date. After work was commenced the contract was modified by the then chief signal officer so that the contractor was to receive payment for each 25 miles completed and accepted, and, in accordance with this modification, payment was made early in June for the first 25 miles from Guantanamo toward Sagua de Tanamo. Soon after this payment the contractor declared his inability to complete the work within the specified time, and asked for a three months' extension, on the grounds of delay, through no fault of his own in obtaining the poles, difficulty in securing labor, violent and frequent storms, and unexpected difficulties of construction owing to the nature of the ground. The extension was granted by the chief signal officer, as it appeared to be a question of doing so or having the line thrown upon the Government to complete; but the contractor was notified that no further advance would be made and that all payments would be withheld until the entire line was completed and accepted according to the original contract.

The line was finished to Sagua de Tanamo May 29, and 19½ miles beyond and toward Baracoa on June 30, while it is expected that the entire line will be completed within the extended time.

Under this head it seems proper to place the reconstruction work, which, though not entirely new, necessitated to a great extent the use of new poles, wire, etc., between Habana and Santa Clara, in the western section, and consisted of betterment of line between Habana and Union, where 500 new poles were placed and 100 old ones reset and 35 miles of No. 9 iron wire was strung; the branch from Union to Alacranes, with 9 new poles and 28 old poles reset and 6 miles of No. 9 iron wire; the main line from Jovellanos to San Jose, on Santiago circuit, a distance of 55 miles, in which work 2 new wires were put up, using 650 new poles, resetting 340 old, and 110 miles of No. 9 iron wire; the main line between Jovellanos and Union, 174 new poles, with 196 old reset and 23 miles of No. 9 iron wire; Sancti Spiritus and Santa Clara (double line, 136 miles old wire), 72 miles, 92 new poles and 986 old reset; Sancti Spiritus to Ciego de Avila, cutting away of 20 feet of timber on each side of line through heavy forest for a distance of 24 miles, using 60 new poles and resetting 123 old.

In the eastern section, on the Bayamo-Manzanillo line, work which was commenced in the previous fiscal year and temporarily abandoned on account of rainy season was resumed between Bayamo and Veguitas, a distance of 23 miles, in which new poles and new No. 9 iron wire were used. The line between Bayamo and Holguin, having been originally constructed in such an unstable manner as to cause constant interruption, was rebuilt for a distance of 67 miles, at an average cost of \$41 per mile, with new poles and 21 miles of No. 9 new wire, while on the balance of the line the No. 9 old wire formerly strung was utilized. The telegraph line between San Luis and Mayari requiring rebuilding, an effort was made to obtain permission from the Cuba company to allow the Government to string a new wire over their poles; but, failing to secure this privilege, work was commenced in May on the reconstruction of the line between San Luis and Palmarito, which, though the work has been greatly delayed on account of the rainy season, will, it is expected, be completed during July.

REPAIR WORK.

General repair work throughout the island has of course been necessary to enable the service to maintain its accustomed efficiency, which work has been both constant and heavy, owing to the character of the lines, nature of the country, and the daily and terrific storms during the rainy season, which not only occasion continual damage by wind, flood, and lightning, but in many instances cause the streams to suddenly rise and become impassable, rendering repair work impossible until the waters subside.

McPHERSON TEMPORARY LINE.

The Government having determined to recover the U. S. army transport *McPherson*, which was wrecked near Matanzas on February 4, 1901, a temporary telegraph line consisting of insulated field cable was hastily laid by the Signal Corps between Matanzas and the wreck, a distance of about 15 miles, and direct communication between that point and Habana via Matanzas was thus maintained until June 2, at which date the vessel was floated to Matanzas, when the line was recovered and the material stored for future use. The dispatch with which this line was built and the efficiency with which it was maintained have brought to the Corps merited words of praise from all officials and others acquainted with the facts and interested in the work of recovery. The chief signal officer, who was a passenger on the wrecked vessel returning from the United States from a leave of absence, having hastened to Habana from Matanzas, immediately made preparations for telegraphic communication with the scene of the wreck, and such was the efficiency of the service and energy displayed that the necessary material shipped from Habana by quartermaster's tug having reached its destination on the morning of the 8th of February, the line was completed and communication established to Habana by 5.45 p. m. of the same day, an operator of the Corps remaining at the wreck to maintain communication, which was so satisfactory to the chief quartermaster in charge of the work as to elicit the following message from him to the chief signal officer, dated Camp *McPherson*, February 10:

"Please accept thanks for the very great promptitude exercised by your department in the installation of the telegraph station at this point. It is now working capitably and will be invaluable to me."

CABLES.

The portion of the old Spanish cable at Cienfuegos laid across the mouth of the harbor and connecting Castillo with Rowell Barracks having failed to work early in 1900, four small copper-armored cables were laid, none of which worked without giving trouble for more than three months and one but two weeks, the cable being unsuited to the work owing to its lightness, it being but one-third of an inch in diameter including the armor, could not withstand the strain of the strong ocean current at this point. This cable was, however, patched up and maintained irregular service until last November, when some single-conductor ocean cable having been obtained from Habana about one-third of a mile was laid between the points mentioned which has proved satisfactory in every respect. In December the main portion of the cable running through the harbor from Cienfuegos to the point from which a short strip of land line connects with Castillo gave out, and investigation leading to the belief that it was beyond repair, a new entire land line between Cienfuegos and the barracks was contemplated, but the scheme was abandoned when it was found that it would cost over \$2,000, and the old cable was patched up by the insertion of new pieces,

which has resulted in keeping up communication to the present, but is of course liable to break down at any time. The old Spanish cable crossing the river at Abreus, in the province of Santa Clara, a distance of one-tenth of a mile, also gave out and was replaced by a new cable which has given entire satisfaction.

The cables across Habana Harbor connecting the city telephone system with Fort Cabañas, Morro signal station, the quartermaster's storehouse, Tricornia, and other military points across the bay have been successfully maintained during the year.

TELEPHONE LINES AND SERVICE.

In the western section of the island much new work has been rendered necessary in Habana through interruptions caused by the construction work of the electric railways, electric light companies, etc., necessitating the removal of lines to other streets, the putting up of new lines of higher poles, and the use of other means for carrying the wire to avoid such obstructions; on account of which changes made to avoid these difficulties, and in connection with the new lines to Columbia Barracks and Quemados, before referred to, the lines within the city have been practically rebuilt, the wire being generally strung on 30-foot poles of good sawed timber, and while, though the copper wire of which the lines were originally built has been utilized in the reconstruction, No. 14 iron wire has been preferred in new work, since copper wire, though generally so well thought of, has not proved satisfactory in actual use on the island, since it expanded under the influence of the heat of the tropical sun so much as to slacken to a dangerous degree, while it is corroded by the damp, salt-laden atmosphere, thus causing it to break without any unusual strain, and in the country, where it has been tested on the telegraph lines, the use of copper has been abandoned, as it was found that the flames caused by the fires in the tall grass and bushes along the line melted the copper to a breaking point. The telephone business transacted through the Signal Corps exchange, which had been moved into more suitable quarters in the second palace, having entirely outgrown the 50-drop switchboard formerly in use, a new 100-drop switchboard was installed during the month of April, and the placing of a full complement of lightning arresters and other work since performed has placed that office on a favorable basis of comparison with like first-class centrals in the United States, and the telephone service rendered by the Signal Corps supplies communication between all fortifications and posts and connects all administrative offices, depots, and quarters—an absolute necessity, owing to the fact that these offices and buildings are so widely scattered and separated.

In connection with target practice and rifle ranges considerable work has been done by the Corps, which, naturally taking an especial interest in that which concerns the line of the Army, has cheerfully responded and promptly met all calls of this nature, while the military telephone service has been supplied wherever the stationing of troops rendered it necessary.

At Columbia Barracks the rifle range was changed from its original position by the commanding officer to a more desirable location on the beach, and at his request a new line was immediately constructed. A firing line was built to facilitate the annual artillery practice, and as the batteries are located on both sides of the harbor, not only was a land line of 4 miles on the Habana side and 2 miles on the Cabañas side constructed, but also a temporary submarine cable half a mile in length was laid across the harbor connecting the land lines and placing all points in communication with each other, for which work the chief signal officer received a letter from Col. William L. Haskin, commanding the artillery corps, expressing his thanks and appreciation for the service the Signal Corps had rendered.

Across the bay from Habana a new line was built between Tricornia station and Tricornia, using 270 new poles and 9 miles of No. 14 iron wire, and also a single line from Morro Castle to the immigrant station, $1\frac{1}{2}$ miles in length, with No. 14 wire and 40 new poles.

The lines between Guanajay and Mariel and Guanajay and Bahia Honda through Cabañas, which were originally built as telegraph lines and changed to telephone service about the end of the last fiscal year, were reconstructed, 229 new poles and 30 miles of No. 14 wire being used in the work.

In the eastern section the most important telephone-line work was the construction of a new line between Baracoa and Cape Maisí. From Cape Maisí vessels are sighted as they pass, and the establishing of communication between that point and Baracoa would permit information signaled in from passing vessels to be telephoned to Baracoa and thence telegraphed over the Government line to Santiago, so that the post-office authorities at that place could send their tug out to the mouth of the harbor and there meet and take the mails from the steamers which under contract approach only thus close to Santiago without entering the harbor. The line would also be of great service

to business interests in enabling all vessels passing to signal news to Cape Maisi station, whence it could be telephoned to Baracoa and from there telegraphed to Santiago and to different points on the island for the information and benefit of all parties interested in commercial and marine affairs. This line was completed in June at a cost of \$4,414.34, and is 45 miles in length, being well built of hard-wood poles and No. 9 iron wire, great difficulty being encountered in its construction, owing to the roughness of the country and rocky character of the ground, which necessitated blasting with dynamite for about 80 per cent of all the post holes dug, in some instances the rock being a species of flint which required from two to three blasts in order to make the hole sufficiently deep and large.

A telephone line was constructed from Santiago along the new road to Morro Castle, a distance of about 6 miles, to replace the old line which, originally built over the mountain and rough country and through heavy underbrush, was difficult to maintain, and a small telephone system was installed at Morro Castle connecting the offices of the post commander and staff and other points with the Santiago system, district headquarters, and the troops at Morro Castle. The 50-drop switch board formerly in the Habana exchange was sent to Santiago, and will greatly improve that system when installed as soon as the contemplated changes, referred to elsewhere, are made in the telephone and telegraph lines of that city, while telephone exchanges were also put in operation at Puerto Principe and Guantánamo.

Accompanying this report and forming Appendix C are directories of the telephone systems of Habana and Camp Columbia.

WORK IN PROSPECT.

In the western section extensive repairs amounting to reconstruction having been found necessary to prevent the Corralillo-Isabela de Sagua line from becoming absolutely useless an appropriation of \$1,200 was asked and allowed in July and August estimates, and at the same time repairs were provided for on the lines between Caibarien and Yaguajay, Santo Domingo and Santa Clara, Cienfuegos and Cruces, and at Regla, while the portion of the main line between Santa Clara and Sancti Spiritus, a distance of 60 miles, which was built by contract early in 1899 of such faulty construction and poor quality of poles as to raise the question of acceptance, referred to in the last annual report, which matter was finally settled in last August by additional work being done by the contractor and his receiving \$500 less than the contract price, and was practically rebuilt in the fall of 1900 by the cutting off and resetting of the poles, an operation which can not be repeated as the poles are already too short, is in such a condition that its rebuilding or the construction of a new line will be absolutely necessary within the next six or eight months. The matter is now under consideration and work will be commenced as soon as the rainy season will permit.

In the eastern section an appropriation of \$3,000 has been made to reconstruct the Guantánamo-Santiago line which, when completed, will make new the entire line from Santiago to Baracoa via Guantánamo and Sagua de Tanamo, and repairs amounting to \$500 are also provided for on the Gibara-Holguín line.

Under arrangement made by former signal officers of the Department of Santiago the Red Telephone Company of that city was permitted to string certain of its wires upon Government poles while the Government made use of the company's poles in connection with its telegraph and telephone system within the city, this arrangement having proved unsatisfactory, the telephone company assuming a dictatorial attitude and demanding extension of privileges detrimental to the service, the then chief signal officer, early in May, directed that all wires of the Red Telephone Company of Santiago be removed from the Government poles, and informed the military commander of that district that the Signal Corps would provide all telegraph and telephone service required by him. In view of this action the telephone company late in June requested the removal of all Government wires from its poles, which demand was met by the chief signal officer recommending the construction of a new lead line in the city of Santiago at an estimated cost of \$800, which was approved by the military governor, and as soon as completed will place the Government in a position entirely independent of outside interference.

SIGNAL CORPS PROPERTY.

Orders having been received in June, 1900, from the Chief Signal Officer of the Army for the return of all United States Signal Corps property, such articles as could be spared or immediately replaced by purchase have been from time to time during the year shipped to the designated officer at the Signal Corps post, Fort Myer, Va., the accompanying alphabetical list (Appendix D) showing the amount and character of the shipments, and the small balance of such property now on the island will be

sent as soon as it can be spared or replaced, with the exception of such as is found to have been worn out or destroyed in service and the few articles, such as heliographs, signal flags, field glasses, etc., required for instruction in military signaling in connection with the troops stationed in Cuba.

OPERATIONS.

In spite of the difficulties existing and constant attention and extraordinary effort required to keep the lines of the island in working order regular communication over the lines generally and on the trunk lines between Habana and Santiago has been maintained during the year except for occasional brief interruptions and during the terrific storms which prevailed in Santiago province and other parts of the island commencing August 30, and continuing with increased severity until September 10, by which time the rivers were swollen out of all proportion and much of the country was under water and the line inspectors and linemen were unable to get to the seat of trouble, as there were no bridges or boats in the country and the rivers were too swollen and swift and wide to swim, making it necessary to wait for the water to subside before even temporary repairs could be made. The extent and seriousness of the damage done and difficulties encountered in restoring communication is graphically portrayed by the following extracts from a report made by the signal officer of the Department of Santiago under date of September 11, 1900:

"On the 2d instant heavy rain began falling all over the province. Reports from operators showed that all streams were rising very fast and there was great danger of lines being washed away. This rain lasted thirty-eight hours without a break; weather report shows 24½ inches of water fell in thirty-eight hours. I had instructed all linemen to constantly patrol their sections with a view of trying to keep lines working, but as the rain continued to fall heavily every day nothing could be done, as the whole country is under water. Main line between here (Santiago de Cuba) and Cristo went down in several places. * * * I have a party of men now hard at work trying to put this line in proper shape. Main line between Palma and Jiguani went down on the 6th, and linemen could not reach the trouble on account of rivers overflowing the country. On the 8th instant Chief Lineman Cooper managed to reach the break and restore communication to Bayamo. I then found Manzanillo line, main lines, and Holguin lines had been washed away, leaving gaps in each from a half to 1 mile in length. On Saturday, the water in the Bayamo River having receded a little, Chief Lineman Quinn was ordered to try and close the break on Manzanillo line. This he attempted to do, and while endeavoring to cross the river with wire his raft was overturned and he was carried away by the flood, but fortunately managed to reach the opposite bank in safety. He closed break in Manzanillo line Saturday evening at 7.30, and swam back to Bayamo side. Sunday morning he went on main lines west of Bayamo, and as all the Cubans had utterly failed to reach the break or refused to attempt to cross the rivers, I ordered Sergeant Turrell to join Quinn and give him all the assistance he could, and if necessary I would ask for a detachment of Tenth Cavalry to assist in restoring the break.

"At this writing Bayamo reports they hope to close the break in a few hours. Sergeant Turrell just reported repair of break at Bayamo River and we can now reach Cauto, but find main line washed away on both sides of the Cauto River. Operator reports that linemen from Tunas reached Salada River, but could not get farther. He says country is under water from 5 to 6 feet and that big stretches of line have collapsed. * * * Sergeant Turrell reports Holguin line just restored, but Holguin reports Tunas line working badly, but thinks can give us Principe via Holguin. Guantanamo, Sagua, and Baracoa were repaired on 7th and are now O. K. Reached Puerto Principe via Holguin at 11.30 a. m. and now clearing delayed business. * * * Expect to start men on main lines at Cauto to-morrow if it is found men can reach break." * * *

And from a telegram, September 13:

"Main lines at crossing of Cauto River were completely washed away. A mile of poles and wire on the other side of Cauto have disappeared. * * * Linemen from Tunas can not cross the Sabanal. * * * Whole sections were washed away between Cauto and Sabanal river. * * * Am doing everything to get these lines up, but it will be slow work on account of the high water * * * which covers an area of some 15 miles."

Communication was, however, soon reestablished between Habana and Santiago, even though the main line was unavailable, by using the line between Bayamo and Holguin and thence reaching the trunk line at Victoria de las Tunas, so that the actual time during which no communication was possible over the Government telegraph lines the length of the island and the commercial cable lines had to be

depended upon was extremely brief, considering the circumstances as shown by the Habana wire reports of that period.

"All communication by wire was lost on the following dates: September 4, from 4.45 p. m. until 8 a. m. September 6, on account of wires Nos. 1 and 2 being grounded east of Santa Clara; * * * September 8, 12.30 p. m. until 12 noon September 11, on account of drift knocking down five telegraph poles at the crossing of the Cautillo River, between Bayamo and Holguin, this being the only wire left with which to communicate with Santiago, as the two main wires had been under water at the Cauto River between Bayamo and Victoria de las Tunas since September 4, and were not repaired until September 16."

Which shows that all communication was broken for but less than six days, and that the main line was working after a short lapse of less than two weeks.

As the list of employees shows Cubans have superseded Americans and have been employed whenever practicable, until at present over 80 per cent of the entire force are natives, though the difficulty in obtaining competent operators on the island has continued and it has been found necessary to secure them from the United States as vacancies occurred, as otherwise the high state of efficiency which has prevailed and which is required to satisfy the public could not have been maintained.

An unusual and extraordinary test of the capacity and efficiency of the system was made on the night of November 6 in the reporting and distributing of the national election returns from the United States. The cable company turned over the news to the telegraph service for distribution over the island on condition that each station receiving news should pay \$25, one-half to go to the cable company and one-half to the operators and linemen of the telegraph service who necessarily remained up all night on the work. Excellent results followed, so that numerous telegrams were received by the chief signal officer of the department from officials and citizens throughout the island thanking the Signal Corps for the excellent and prompt manner in which the work was performed. In the previous August the commanding general of the department, in making an extended inspection tour, was able to receive full reports daily at each successive station.

The same pleasant relations with the cable companies have been continued, and through the kind cooperation of the Inter-ocean Cable Company the Signal Corps has received during the year and has been able to repeat throughout the island the tin e signals sent from Washington at 12 m. each day and to regularly drop the time ball placed by it in a conspicuous position on the building occupied by the captain of the port.

The changes in telegraph stations during the year have been comparatively few, offices having been opened at Fomento and Trinidad, on the new line, and at Vuel-tas, Corral Falso, and Perico as business warranted, and at Quiebra Hacha, Ingenio Asentista, Mercedesita, San Claudio, Luisa, Brameles and Asilo Reformatorio (Guanajay) in connection with the Guanajay telephone line, while the following named offices were abandoned on account of lack of business: Contra-Maestre, Pelayo, Rincon, Jiguani, Songo, and Veguitas. While the offices opened and closed during the year consisted of that at Palmariá, maintained during the rebuilding of the San Luis-Mayari line, and the temporary station at the scene of the wreck of the U. S. army transport *McPherson*.

The routing of the United States-Porto Rico cable business over the Government telegraph lines between Habana and Santiago, by which diversion special low concessionary rates were secured, inaugurated just prior to the end of the last fiscal year and referred to in detail in the last annual report, has been continued during the year with regularity and dispatch.

The general working of the telegraph service during the year has been exceedingly satisfactory. Complaints have been very few, and when made, investigations, which have been promptly and invariably made, have proved them to be either wholly without reason or of such character as to be incidental to the management of all tele-graph services.

With the present increased volume of commercial business throughout the island he wires are tested to their utmost capacity, and while telegrams are generally dispatched with promptness as filed, traffic could be facilitated were it not a fact that all business between eastern and western points in the island is forced to pass over one wire between Santa Clara and Santiago, as the second wire must be used for local business, and the service could be materially benefited by stringing another wire from Santa Clara to Puerto Principe, and that office could relay between Habana and the following stations: Santa Cruz del Sur, Nuevitas, Lugareño, Guaimaro, Victoria de las Tunas, Puerto Padre, and Cauto, relieving congestion on the through wire, and should the business increase in the next year in the same proportion that it has in the last this would not only be necessary, but, in addition, another wire would be needed to Santiago.

The report of the disbursing clerk of the Signal Corps, which forms Appendix E to this report, is devoted to the financial statistics of the Signal Corps of the department, showing in detail the disbursements and earnings of this branch of the service. The report of the telegraph and cable auditor of the Signal Corps forms Appendix F, and pertains to the general traffic of the service, showing in detail the telegraphic receipts and disbursements.

While the term of service of the present chief signal officer has been limited and his time of observation brief, his experience enables him to have the pleasure of commending generally in this official report the services of the enlisted men and civilian employees for the efficient and faithful manner in which they have performed their duties. Appendix G shows a list of stations and employees as existing at the end of the fiscal year.

There were handled during the year 237,972 commercial messages and 159,719 on official business, a total of 397,691 messages, while during the previous year the military telegraph lines handled 175,313 commercial messages and 170,157 on official business, a total of 345,470 messages, an increase during the present fiscal year in the total of commercial business handled of 62,659 messages, while, on the other hand, the official business shows a falling off of 10,844, owing to the elimination of military departments on the island and the withdrawal of troops.

The above statement of the number of commercial and official messages, while it concludes the consideration of the business handled from a source of revenue standpoint, does not by any means show the actual amount of work performed by the operators of the service, since messages are necessarily relayed at eighteen separate offices on the island, where they have to be both received and sent, and represent a total of 673,848, which, added to the 397,691 commercial and official business, makes a grand total of 1,071,539 messages as the actual number handled during the year by the operators of the military telegraph service.

The actual cash received by the service from its commercial messages during the year amounted to \$79,726.63, as against \$57,712.13 received during the previous year, an increase of \$22,014.50, or an increase of nearly 40 per cent, while the value of official business would amount, reckoned at regular tariff rates, to \$113,597.81 and the other line business to \$22,664.61. These figures, however, do not show the entire financial benefit that has accrued to the Government by the maintenance of its lines, since had it not been practicable to transact this business over the Government lines, and had it been necessary to send it over the lines of the ocean cable companies, the cost of official business alone would have amounted to \$269,925.11 on the basis of \$1.69 per message, as shown by the accounts of the cable company.

This showing of business transacted and revenue received and the extraordinary increase in the commercial traffic of the lines is most gratifying, not only on account of the increased income displayed, but particularly as substantial evidence of the advancing prosperity of the island and progress in its commercial and business affairs and continued and increasing confidence engendered in the security and efficiency of the Government telegraph service.

APPENDIX E.

OFFICE OF THE CHIEF SIGNAL OFFICER,
DEPARTMENT OF CUBA,
Habana, July 6, 1901.

SIR: In compliance with the verbal instructions of the chief signal officer of the department, I have the honor to submit the following report of the disbursements of this office for the fiscal year ending June 30, 1901. This report embraces all expenditures of the Signal Corps in the Department of Western Cuba for the period from July 1, 1900, to November 30, 1900, and in the consolidated Department of Cuba for the period from December 1, 1900, to June 30, 1901, the disbursements being made by Capt. Edward B. Ives, Signal Corps, U. S. V., disbursing officer, for the month of July, 1900, and by the present disbursing clerk of the corps for the remainder of the period covered by this report:

STATEMENT.

Amounts received.

From treasurer:	
July.....	\$15, 710. 29
August.....	11, 064. 67
September.....	12, 039. 47
October.....	13, 035. 29

From treasurer—Continued.

November	\$11, 877. 01
December	20, 902. 27
January	24, 137. 07
February	24, 154. 06
March	22, 056. 06
April	22, 101. 06
June	48, 023. 62
Total	225, 100. 57
From disbursing officers:	
December	1, 157. 62
Grand total	226, 258. 19

Disbursements.

July, 1900:

Salaries	\$6, 964. 97-
Rents	279. 78
Light, water, and ice	67. 07
Quarters, enlisted men Signal Corps	322. 00
Current supplies	1, 874. 52
Cable bills	4. 00
Total	9, 512. 43

August:

Salaries	7, 326. 88
Rents	327. 28
Light, water, and ice	19. 52
Quarters, enlisted men Signal Corps	236. 00
Transportation	28. 20
Current supplies	295. 32
Customs duties	94. 70
Repairs and reconstruction telegraph lines	7. 01
Total	8, 334. 91

September:

Salaries	6, 823. 77
Rents	322. 08
Light, water, and ice	87. 57
Quarters, enlisted men Signal Corps	232. 80
Transportation	59. 43
Current supplies	1, 836. 94
Customs duties	300. 19
Repairs and reconstruction telegraph lines	570. 01
Construction new telegraph lines	1, 500. 00
Total	11, 712. 74

October:

Salaries	7, 515. 00
Rents	451. 40
Light, water, and ice	214. 78
Quarters, enlisted men Signal Corps	227. 20
Transportation	40. 83
Current supplies	187. 50
Customs duties	131. 85
Repairs and reconstruction telegraph lines	300. 12
Miscellaneous	232. 07
Total	9, 300. 84

November:

Salaries.....	\$7,562.60
Rents	367.28
Light, water, and ice	118.40
Quarters, enlisted men Signal Corps	194.40
Transportation	86.19
Material purchased to replace United States Signal Corps property ..	89.70
Current supplies.....	595.76
Repairs and reconstruction telegraph lines	584.43
Total	9,598.86

December:

Salaries.....	7,451.60
Rents	371.62
Light, water, and ice	96.16
Quarters, enlisted men Signal Corps	124.00
Transportation	25.45
Material purchased to replace United States Signal Corps property ..	86.55
Current supplies.....	32.60
Cable bills	2,020.57
Repairs and construction telegraph lines	1,424.28
Total	11,632.83

January, 1901:

Salaries.....	12,467.09
Rents	575.90
Light, water, and ice	111.87
Quarters, enlisted men Signal Corps	217.60
Transportation	139.66
Material purchased to replace United States Signal Corps property ..	113.08
Current supplies.....	331.31
Customs duties	144.08
Repairs and reconstruction telegraph lines	1,213.33
Miscellaneous	275.80
Total	15,589.72

February:

Salaries.....	13,467.53
Rents	689.64
Light, water, and ice	131.38
Quarters, enlisted men Signal Corps	180.00
Transportation	51.91
Material purchased to replace United States Signal Corps property ..	3,190.30
Current supplies	1,373.81
Customs duties	377.83
Cable bills	770.90
Repairs and reconstruction telegraph lines	1,342.10
Miscellaneous	6.45
Total	21,581.85

March:

Salaries.....	14,287.83
Rents	566.57
Light, water, and ice	146.22
Quarters, enlisted men Signal Corps	168.80
Transportation	87.13
Material purchased to replace United States Signal Corps property ..	2,444.00
Current supplies	1,113.03
Customs duties	451.12
Cable bills	711.88
Repairs and reconstruction telegraph lines	2,118.79

March—Continued.

Construction new telegraph lines	\$1, 769. 10
Miscellaneous	55. 50
Total	<u>23, 919. 97</u>

April:

Salaries	14, 374. 67
Rents	474. 89
Light, water, and ice	117. 78
Quarters, enlisted men Signal Corps	134. 00
Transportation	220. 94
Material purchased to replace United States Signal Corps property ..	499. 50
Current supplies	837. 31
Cable bills	607. 06
Repairs and reconstruction telegraph lines	3, 442. 86
Construction new telegraph lines	617. 26
Miscellaneous	21. 07
Total	<u>21, 347. 32</u>

May:

Salaries	7, 290. 64
Rents	211. 00
Light, water, and ice	192. 50
Quarters, enlisted men Signal Corps	48. 80
Transportation	34. 24
Current supplies	237. 42
Customs duties	1, 179. 67
Repairs and reconstruction telegraph lines	601. 90
Construction new telegraph lines	1, 873. 65
Total	<u>11, 669. 82</u>

June:

Salaries	30, 025. 58
Rents	956. 55
Light, water, and ice	276. 40
Quarters, enlisted men Signal Corps	84. 00
Transportation	83. 80
Material purchased to replace United States Signal Corps property ..	3, 202. 08
Current supplies	4, 826. 36
Customs duties	826. 01
Cable bills	912. 70
Repairs and reconstruction telegraph lines	3, 346. 59
Construction new telegraph lines	6, 366. 44
Total	<u>50, 906. 51</u>
Grand total	<u>205, 107. 80</u>

RECAPITULATION.

Salaries	\$135, 558. 25
Rents	5, 593. 94
Light, water, and ice	1, 579. 63
Quarters, enlisted men Signal Corps	2, 169. 60
Transportation	837. 78
Material purchased to replace United States property	9, 625. 21
Current supplies	13, 541. 88
Customs duties	3, 505. 45
Cable bills	5, 027. 20
Repairs and reconstruction telegraph lines	14, 951. 52
Construction new telegraph lines	12, 126. 45
Miscellaneous	590. 89
Total	<u>205, 107. 80</u>
September 14, 1900, deposited with treasurer	903. 00
June 29, 1901, deposited with treasurer	4, 278. 54
June 30, 1901, balance on hand	15, 968. 85
Grand total	<u>226, 258. 19</u>

In addition to the disbursement of funds allotted from the insular treasury for the operation and maintenance of the telegraphic service of the department, this office is charged with the collection and accounting for of the revenues of the military telegraph offices of the service. These revenues are divided under two heads, viz, "This line receipts" and "Other line receipts." "This line receipts" being the tolls derived from messages handled entirely by the Signal Corps lines and the Signal Corps' proportion of tolls on messages originating at offices on their lines but requiring transfer to some connecting line for ultimate delivery; while the "Other line receipts" are the proportion of the tolls due to the connecting line for their part of the joint service performed on messages of the latter class.

These receipts are classified by the auditor of the service. The "This line receipts" are deposited to the credit of the treasurer of the island, while the "Other line receipts" are paid over to the several connecting lines on whose account they were collected.

The following is a statement of the telegraph receipts and the disposition of same for the past fiscal year:

Receipts, deposits, and disbursements of funds, telegraph line.—Receipts for the fiscal year ending June 30, 1901.

Receipts.	This line.	Other line.	Total.
July	\$5,344.95	\$1,591.16	\$6,936.11
August	6,018.23	1,403.70	7,421.93
September	5,634.18	1,604.09	7,238.27
October	5,485.58	1,704.52	7,190.10
November	5,990.67	1,830.30	7,820.97
December	6,815.24	2,055.15	8,870.39
January	7,849.95	2,407.45	9,757.40
February	6,779.71	2,273.51	9,053.22
March	7,483.08	2,509.34	9,992.42
April	7,489.68	1,825.38	9,315.06
May	7,884.37	1,989.49	9,873.86
June (incomplete)	3,529.42	555.26	4,084.68
Total	75,805.06	21,749.35	97,554.41
Deposited to credit of treasurer of Cuba	75,805.06		75,805.06
Paid to connecting lines		21,045.38	21,045.38
Balance on hand		703.97	703.97
Total	75,805.06	21,749.35	97,554.41

Respectfully submitted.

A. T. RUAN,
Disbursing Clerk, Signal Corps.

P. S.—In addition to the above statement of the disbursements made from Habana on behalf of the Signal Corps for the fiscal year 1901 the sum of \$30,209.86 was placed to the credit of Lieut. John J. Ryan, signal officer, United States Volunteers, at Santiago, during the period from August 1 to November 30, 1900, of which amount \$29,052.24 was disbursed by him for salaries and miscellaneous expenses of the service and the balance of \$1,157.62 was transferred to the disbursing clerk of the corps at Habana. Owing to no report of these disbursements having been rendered by Lieutenant Ryan and his retained papers having been carried with him at the time of his departure from Cuba, no itemized report of these expenditures can be made.

APPENDIX F.

OFFICE OF THE CHIEF SIGNAL OFFICER, DEPARTMENT OF CUBA,
Habana, Cuba, August 3, 1901.

SIR: In accordance with instructions of the chief signal officer, Department of Cuba, I have the honor to submit the following report on the auditing of telegraph and cable accounts of the Government telegraph lines for the fiscal year ending June 30, 1901:

As stated in the last Annual Report of the Chief Signal Officer, the Government lines in Cuba are, from an auditing standpoint, operated under the same system as that of the Western Union Telegraph Company, and, as far as practicable, closely follow the larger telegraph companies in their methods of bookkeeping.

The operations of the lines in Cuba during the past fiscal year, as shown by the traffic statement attached hereto, reveal a marked increase in the number of messages handled, and a consequent increase in line receipts near to 40 per cent over last year. This can be accounted for by the extension of the lines and equipment, together with the consequent improvement in the facilities afforded for the prompt dispatch of the increased traffic. In this respect the telegraph service can be compared to a barometer by which the fluctuations of the commerce of the island can be determined, so that our receipts for the fiscal year just ending, compared with previous reports, tend to show that the industries of the island are being rapidly reestablished along improved methods, as indicated by the additional patronage given to the telegraph service.

During the fiscal year just ending the Government lines handled 237,972 commercial telegrams, collecting tolls ("This line") amounting to \$79,726.63, an average toll per message of 35 cents; 159,719 official telegrams were transmitted for the account of the Government (for which no billing has been made), at a tariff valuation of \$113,597.81; average valuation of each message, 71 cents.

If the Government lines had not been available for the last-named service, rendering it necessary to transmit all official telegrams via the lines of the local cable company, it is estimated that the cable tolls would have amounted to \$269,925.11, figuring on a basis of \$1.69 per message, as found by reference to official accounts from the Cuba Submarine Telegraph Company, audited by this department.

Having reference to the auditing of the accounts received from connecting lines for services rendered in the transmission of official telegrams, would state that all accounts up to and including December, 1900, have been audited and settled, leaving on hand (audited and ready for settlement) accounts covering service for the first quarter of 1901. The payment of the last mentioned will complete all accounts on hand for the above-named service.

Very respectfully,

S. N. BERNHARDT,
Auditor Telegraph and Cable Accounts,
United States Signal Corps, Department of Cuba.

Capt. OTTO A. NESMITH,
Chief Signal Officer, Department of Cuba,
Habana, Cuba.

Traffic statement, fiscal year ending June 30, 1901.

"THIS LINE" MOVEMENT, FISCAL YEAR 1900-1901.

Receipts:	
To "This line" receipts	\$79,570.08
To telephone receipts.....	106.00
To guaranteed receipts.....	4.02
To miscellaneous receipts	47.53
Total	<u>79,726.63</u>
Disbursements:	
By ordinary disbursements money-order fees.....	175.02
By refund and uncollectible.....	20.67
By miscellaneous.....	206.08
By cash transferred to treasurer of the island	75,805.06
By balance carried forward	3,519.80
Total	<u>79,726.63</u>

The above (June complete) shows increase over previous fiscal year of \$22,237.48.

COMMERCIAL LINE RECEIPTS.

Receipts "This line"	\$79,726.63
Receipts "Other line"	22,664.61
Total	<u>102,391.24</u>

CHIEF SIGNAL OFFICER.

999

Commercial messages handled.....	237,972
Average tolls collected for each message ("This line" proportion).....	\$0.33
O. B. messages transmitted.....	159,719
Valuation at tariff rates.....	\$113,597.81
Average valuation each message.....	\$0.71

RECAPITULATION.

Commercial messages handled.....	237,972	\$79,726.63
O. B. and W. D. messages handled.....	159,719	113,597.81
Total.....	397,691	193,324.44

NOTE.—"Other line" receipts, \$22,664.61.
Reference to "Other line" movement will show disposition, leaving balance carried forward of \$159.67.

Statement showing for each month the telegraph-line receipts, number of messages handled, and money valuation of all Government telegrams (at tariff rates).

TELEGRAPH LINE RECEIPTS, FISCAL YEAR ENDING JUNE 30, 1901.

Month.	Commercial.		Government.	
	Messages.	"This line" amount.	Messages.	Amount.
1900.				
July.....	17,175	\$5,356.16	16,783	\$8,647.09
August.....	17,746	6,081.58	15,504	10,663.24
September.....	18,235	5,681.01	15,717	11,521.83
October.....	17,881	5,501.00	13,600	9,084.63
November.....	17,888	6,005.40	11,488	8,861.17
December.....	20,324	6,829.48	11,902	7,868.03
1901.				
January.....	21,333	7,462.49	11,789	8,799.28
February.....	19,924	6,828.23	11,075	8,763.26
March.....	22,304	7,503.57	11,737	8,822.88
April.....	21,719	7,556.19	13,195	8,558.53
May.....	22,440	7,904.46	13,877	11,268.86
June.....	21,003	7,067.06	13,062	10,739.01
Total.....	237,972	79,726.63	159,719	113,597.81

Other line movement, fiscal year ending June 30, 1901.

TRAFFIC TRANSFERRED TO INTERNATIONAL OCEAN TELEGRAPH COMPANY, HABANA.

Month.	Commercial.	Official.
1900.		
July.....	\$1,380.90	\$227.16
August.....	1,326.15	207.34
September.....	1,354.66	134.00
October.....	1,480.59	154.41
November.....	1,592.78	153.56
December.....	1,702.96	142.94
1901.		
January.....	1,710.88	122.25
February.....	1,745.15	198.68
March.....	1,781.09	130.93
April.....	1,329.11	100.46
May.....	1,296.10	115.57
June.....	1,042.66	209.14
Total.....	17,732.53	1,896.44

Other line movement, fiscal year June 30, 1901—Continued.

TRAFFIC TRANSFERRED TO CUBA SUBMARINE TELEGRAPH COMPANY, AT ALL STATIONS

Month.	Commercial.	Official.
1900.		
July.....	\$106.27	\$310.48
August.....	50.02	131.50
September.....	292.23	214.13
October.....	212.74	168.91
November.....	122.88	153.87
December.....	78.12	122.66
1901.		
January.....	92.49	103.22
February.....	76.33	78.97
March.....	44.41	88.06
April.....	47.00	104.71
May.....	38.17	70.29
June.....	15.68	33.10
Total.....	1,176.34	1,579.90

TRAFFIC TRANSFERRED TO WEST INDIA PANAMA TELEGRAPH COMPANY, SANTIAGO.

1900.		
July.....	\$3.96	
August.....	17.37	
September.....	20.40	
October.....	11.46	
November.....	8.01	
December.....	16.95	
1901.		
January.....	49.65	
February.....	41.25	
March.....	44.19	
April.....	14.58	
May.....	20.01	
June.....	21.66	
Total.....	269.49	

TRAFFIC TRANSFERRED TO FRENCH CABLE COMPANY.

1900.		
July.....		\$0.95
November.....	\$100.31	3.55
December.....	276.33	.61
1901.		
January.....	511.06	10.31
February.....	461.06	3.36
March.....	542.00	4.35
April.....	482.12	
May.....	571.27	2.86
June.....	379.46	
Total.....	3,323.61	25.99

APPENDIX No. 7.

FINAL REPORT OF MAJ. W. A. GLASSFORD, SIGNAL CORPS, ON OPERATIONS OF MILITARY TELEGRAPH LINES IN PORTO RICO.

WASHINGTON, D. C., April 11, 1901.

SIR: I have the honor to submit a résumé of operations pertaining to the United States military telegraph lines, Department of Porto Rico, since July 1, 1900.

At the close of the fiscal year, June 30, 1900, the Signal Corps had completed the rebuilding of the lines that had, after long use, been destroyed by the cyclone of August 8, 1899.

The lines thus restored were as follows:

Rebuilt.—San Juan to Humacao via Jajardo; San Juan to Ponce, double wire; Ponce to Mayaguez; San Juan to Mayaguez (completed during July, 1900).

Recovered.—Humacao to Caguas; Ponce to Arroyo; Ponce to Adjuntas; Mayaguez to Las Marias; Aguadilla to Lares; Aibonito to Barros.

Not rebuilt or recovered.—Arecibo to Adjuntas; Lares to Utuado; Arroyo to Humacao.

It will be seen that with the exception of Utuado and the small towns of Yabacoa and Manabo, the island of Porto Rico was given by the Signal Corps lines of telegraphic or telephonic communication to or through all its important towns, and a heliograph line from Jajardo light to the island of Vieques (Crab Island) that was not operated under the Spanish authorities.

That offices were not opened in smaller towns was owing to the fact that their commercial importance, measured by the business transmitted by wire, was so trivial as not to warrant the expense.

The Signal Corps had projected the rebuilding of a complete circumvallation of the island, a line across it passing through the important coffee district of Utuado, and some branches connecting towns with important industries. The apparent policy of the Government to build as few lines as possible, providing only for telegraphic communication where needed for governmental or military purposes, was adhered to.

On May 1, 1900, the military government gave place to a civil one, and the War Department further discouraged building of telegraph lines; in fact, no more extension was initiated and only that under way completed.

When the civil government was installed, under act of April 12, 1900, the telegraph system continued as military lines and so was maintained and operated by the Signal Corps. The commanding general advocated its transfer to the insular authorities, and upon the discontinuance of the island of Porto Rico as a separate military department transfer was ordered and gratuity made to the island of 806.6 kilometers of line (504 miles), valued at \$36,294.27, the cost of the rebuilding, not considering expense of transportation. This transfer was effected February 1, 1901.

The tools, batteries, instruments, etc., which were necessary to maintain and operate the line, being property nonexpendable and belonging to the United States, were sold to the island at invoice price. This sum amounted to \$4,529.74 and was turned into the United States Treasury.

These instruments, tools, etc., were of modern pattern, used in the system known as the American Morse, and were necessary for the operation, as nearly all the Spanish instruments, tools, etc., in use at the time of the invasion of the United States Army in 1898 had disappeared, owing in a large measure to their destruction by the Spanish operators under orders from the Spanish governor-general of Porto Rico, that they might not be used by the American troops.

These telegraph lines, such as they were, under Spanish authority, had been operated in conjunction with the mail service. It may be said that all its employees were Spaniards or those in full sympathy with Spanish methods. These employees, soon after the evacuation of the troops of Spain, met and agreed to accept no employment in the United States military telegraph service whatever, or to practically boycott it. This agreement was adhered to by all the Spanish telegraphers but one throughout the entire period the Signal Corps operated the lines. This was illustrative of the universal and instinctive Spanish resistance to progressive methods that are in touch with modern scientific development. The Signal Corps administration stood ready to give place to the residents of the island provided the military authorities were in some way guaranteed that its means of telegraphic communication would be effectively continued. That the old Spanish telegraphers had only in mind the restoration of the old order of things, with the salaried places which the telegraph in their hands would imply, is evidenced by the following, which is a bill for the organization of the telegraph service in Porto Rico, and which I am informed passed the body before which introduced, but failed in the executive council:

H. B. 37.

IN THE HOUSE OF DELEGATES OF PORTO RICO,
December 11, 1900.

Messrs. Egozcue, Sanchez Morales, Serrano, Carrion, Blondet, Rodriguez, and Zechini introduced the following bill:

A BILL On the organization of the telegraph service in Porto Rico.

Be it enacted by the legislative assembly of Porto Rico:

First. The telegraph service in Porto Rico is considered as a public expense.

Second. The legislature shall adopt the necessary measures to organize the said

service, providing personnel and material therefor in accordance with the following basis and estimates:

PERSONNEL—HOW TO FORM IT.

A. The chief, who shall organize the personnel and salaries, shall be elected by the governor from a ternary ticket formed by the executive council.

The said chief shall have knowledge of the individuals fit to serve as telegraph operators, by whatever system may be employed, and the said chief shall propose to the governor, after previous examination, those who shall discharge the services provided by the estimates.

If, for any reason, there is not a sufficient number of telegraph operators for all the requirements of the service, it shall be provisionally attended to by those actually procurable, and there shall be established in the central office a practical school, to which there shall be only admitted young men of more than eighteen years of age, of well-known morality and intelligence.

SERVICE.

The telegraph service of Porto Rico shall at the present time consist of the following offices:

San Juan.—One central office, manipulating cabinet, and warehouse.

Of first class.—Ponce and Mayaguez.

Of second class.—Arecibo, Aguadilla, San German, Yauco, Guayama, and Humacao.

Of third class.—Bayamon, Vega-baja, Manati, Sabana Grande, Guayanilla, Arroyo, Yabucoa, Carolina, Caguas, Cayey, Aibonito, Coamo, Juana Diaz, Barros, Adjuntas, Utuado, Lares, San Sebastian, Toa-alta, Fajardo, Rio Grande, and Cabo Rojo.

ESTIMATES.

Central office:

One chief, at	\$2,000
One clerk, second chief, at	1,200
Two clerks, at \$300	720
One warden storekeeper, at	300
One telegraph operator, at	1,000
Five telegraph operators, at \$400	3,000
Two messengers, at \$180	360
	<hr/> \$8,580

Ponce:

One chief, at	1,000
One clerk, at	360
One telegraph operator at	600
Five telegraph operators, at \$500	2,500
Two messengers, at \$180	360
	<hr/> 4,820

Mayaguez:

One chief, at	1,000
One clerk, at	360
One telegraph operator at	600
Three telegraph operators, at \$500	1,500
Two messengers, at \$180	360
	<hr/> 3,820

Second-class offices:

Six telegraph operators for the six offices, at \$600	3,600
Six telegraph operators for the six offices, at \$500	3,000
Six messengers, at \$144	864
	<hr/> 7,464

Third-class offices:

Twenty-two telegraph operators for the twenty-two offices, at \$500	11,000
Twenty-two messengers for the same, at \$144	3,168
	<hr/> 14,168

Linemen:

Twenty linemen, at \$300	6,000
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For inspections of the chief and traveling expenses of the personnel while in service

1,000

Rent of buildings:	
One central station, etc	\$1,000
Two offices of the first class, at \$500	1,000
Six offices of the second class, at \$120	720
Twenty-two offices of the third class, at \$96	2,112
	<hr/> \$4,832
Technical and line material, repairs	2,500
Office expenses:	
Printing material for all the offices	2,000
Lighting	500
Stationery	1,500
	<hr/> 4,000
Total	57,184

Third. Should the military government deliver the telegraph lines before the organization of the service, with the necessary personnel, a committee of three operators shall hereby be appointed who shall meanwhile take charge of the direction of the service, reporting to and receiving orders from the department that may be designated by the assembly.

It is to be noted that the prospective cost as per this bill is within \$265.88 of the expense of the Spanish lines in Porto Rico for 1898, or the twelve months prior to American occupation. It contemplates also the restoration of the old Spanish system, with the building of some new lines.

A table is included showing all the telegraph stations established in Porto Rico since its occupation, with time in operation and average receipts per month.

In closing the operations of the Signal Corps in Porto Rico, the history of the telegraph of the island since its inception and the work of the Signal Corps is inserted here, which, taken in connection with former annual reports and Senate Doc. No. 429, Fifty-sixth Congress, first session, will show their growth, operation, and change from the Spanish to the American system.

A royal decree approving a suggestion of the Captain-General of the island of Porto Rico, made in 1863, concerning the erection of telegraph lines, was issued on June 12, 1864. Following this approval estimates were submitted by the Captain-General and a royal decree was issued June 12, 1866, setting forth the condition of construction and the acceptance of donations. Information regarding source of the donations of money and property amounting to \$19,247.98, with instruments, the value of which is not known, is not obtainable. Approval of the estimates followed November 16, 1866, in which \$20,000 was appropriated, and the donations had increased to \$20,298.48, besides the instruments mentioned. Proposals for the work, it is said, found no bidders, and the construction was taken up finally by the department of public works. The construction of the line, after various vicissitudes, was thus begun, and it was open for communication between San Juan and Rio Piedras on November 22, 1869. The line from Rio Piedras, via Caguas, Humacao, and Guayama, to Ponce, around the eastern end of the island, was completed May 27, 1870, while that portion around the western end of the island, from Rio Piedras, via Arecibo and Mayaguez, to San German, was completed May 17, 1871. A gap was thus left in the line of circumvallation between Ponce and San German; total length of construction line, 455.6 kilometers. For strategic reasons, however, the closing of the gap between San German and Ponce, thus completing the circuit, was prohibited by royal order. It was considered by the military authorities that by completing this belt of circumvallation intercommunication between all parts of the island might take place without the message passing through the capital, and this facility for the transmission of telegrams might give rise to conflicts. An abstract of the royal order, from "Recista de Telegrafos," volume 10, 1870, page 284, is as follows:

"A royal order of the 12th of May, 1870, formally interdicts the prolongation of the line between Mayaguez and Ponce, because, by the completion of this line intercommunication could take place between all parts of the island independently of the capital, which might give rise to real conflicts."

This interdiction, however, was removed later and the construction continued. Up to the close of the year 1876 there had been added 308.6 kilometers, making a total of 764.2 kilometers of line constructed, 750 of which belonged to the Crown and 14 were municipal property. These lines closed the gap between San German and Ponce, as well as that overland between Canuas and Ponce, and added one around the north-east end of the island from Rio Piedras to Humacao; it also included a branch from Aguadilla to Lares, as well as a short line from Ponce to Playa de Ponce. The privilege to erect a telegraph line was authorized to the proprietors of the baths of Coamo

from Coamo to said baths. (*Gaceta de Puerto Rico*, April 22, 1875.) A line was also authorized from Mayaguez to its Playa February 13, 1877.

Subsequent to this, various supplementary lines were built uniting interior towns with the main lines, such as the lines Arecibo to Ponce via Utuado, from Utuado to Lares, from Mayaguez via Las Marias to Maricao, from Manati via Ciales to Moravia, Bayamon to Corozal, Caguas to Comerio, and Cayey to Cidra. Later, when the French railway was constructed, the lines San Juan to Camuy, Aguadilla to Hornigueros, and Yauco to Ponce were removed and set up along the section of the railroad. The telegraph line, it is said, was changed to parallel the line of the railway at the same time of its construction, which was mostly in 1892 and 1893. The total length of the line thus constructed, by authority and appropriation of the Spanish Crown, amounted to 1,000 kilometers, or 1,249.5 kilometers of wire, counting the double lines. From data published in the *Gaceta de Puerto Rico* during their construction it has been ascertained that the average cost of the material constituting the main telegraph lines, 764 kilometers in length, was \$45.10, United States currency, per kilometer. The length of the entire system of lines was finally brought up to 1,000 kilometers, which, at the above rate, would have cost in all \$45,100, plus \$2,090.70, the cost of 249.5 kilometers of additional wire for that portion of the line which was strung double, making \$47,090.70, United States currency. This estimate does not include the labor, data for the estimate of which is wanting.

From the available data of 1878 it is seen that at this time there were 87 permanent operators of the telegraph, receiving salaries paid by the Government amounting in the aggregate to \$45,500, United States currency, yearly. There were also 9 municipal telegraph operators, whose pay is not itemized in any of the reports at hand. The administrative department consisted at this time of an inspector-general, a subdirector, an officer of the first section, an officer of the second section, and 4 officers of the first station. The large expense of the personnel seems to have decided the Spanish authorities to unite the telegraph line with the postal service, which was done by royal decree dated May 23, 1884. A short time before the occupation of the island by the United States Government a private line was authorized between Mayaguez and San Juan. The wire of this line was carried by the Government poles and was operated by the Government operators, and was necessitated by the poor service rendered by the then two existing outlets serving Mayaguez. This line was totally destroyed or allowed to go to ruin after the cyclone of August 8, 1899, though the owners were notified of its state and prospective ruin if not recovered. At the time of the occupation by the United States Government there were 98 telegraph operators employed, receiving an aggregate salary of \$95,749.80 pesos, or \$57,499.88, United States currency, which includes employees at both state and municipal offices, but not messengers and other subordinates. From the best sources of information there were in all 184 employees. When the Signal Corps took possession of the telegraphs the lines were found to be uncared for and in a very dilapidated state; vegetation had grown everywhere to touch the wires, and very strong battery power, equally distributed, was necessary to overcome bad insulation. The offices had been abandoned, and the instruments, which were of antique pattern of Morse register and tape, had been mostly destroyed or damaged. The Continental code was the only one in use. Measures were immediately taken to put the lines in repair, and most of them were continued in service until the cyclone of August 8, 1898, which practically prostrated the entire system, making reconstruction of the main lines imperative. While the material for the new lines was being collected, however, it became again necessary to reestablish temporary communication, mainly with the debris of the wrecked material. The wires were hunted up in the adjoining fields and hung on the few remaining poles, on trees, and on any suitable object that was found in its course. In this way the service was promptly reestablished, but was maintained with much difficulty until the opening of the new line. The construction of the new lines was carried out on quite a different plan from that adopted in the old ones, which generally followed close to the roadside, irrespective of trees and vegetation, the poles being often set in insecure ground. An entirely new survey was made of the country through which the new lines were built, and while following the general course of the roadway and sufficiently close to it to be always in sight, straight lines were struck, passing over suitable ground, free from trees, where the poles could be solidly set, without the probability of their being washed out or injured by landslides. The problem of crossing the main mountain range on the line between San Juan and Ponce offered considerable difficulty, as the road from Cayey to near Coamo skirts the mountain sides in winding curves for most of the distance and is in many places subject to landslides. The difficulties on the northern side were overcome by placing the line along the valley of the Plata River to the point where the river bends sharply to the

north, then following the spurs from the main ridge to Buena Vista, near Aibonito. The descent on the northern side was accomplished by one straight line from about a kilometer north of the Assomanta Peak, passing over the latter and following the crest of a prominent spur down to the Cuyon River, thus avoiding the picturesque but tortuous and windy gorges, through which passes the military road. Between Juana Diaz and Ponce it was necessary to place the line out of reach of the frequent floods which periodically inundate that portion of the country now crossed by the military road. In order to do this a route was located on the north of the road, higher up on the spurs, crossing the waterways in easy spans where the banks were above the high-water mark.

In locating the lines it was the constant aim, in addition to their security, to so place them that they would not be interfered with by cultivation, and it is believed that this had been successfully accomplished. The lines of circumvallation were located and constructed on precisely the same principles as the main line from San Juan to Ponce; and, as in the latter, a saving from a fifth to a quarter of the distance over preexisting lines has been attained.

The telegraph lines as at present distributed serve the cane and tobacco districts throughout the island with the exception of the country between Arroyo and Humacao. They also serve a considerable portion of the coffee districts, but the important coffee districts of Utuado or the interior of the west central portions of the island are at present without telegraphic communication.

RÉSUMÉ.

Construction.

Cost of material, Spanish Crown lines, Porto Rico, per kilometer, not including labor.....	\$45. 10
Original cost of entire Crown system, labor not included	47, 090. 70
Cost of 1,117 poles for repair	4, 044. 00
Total cost of system, labor not included.....	<u>51, 134. 70</u>

Operation.

Receipts for the telegraph, 1878 (latest published data available)	19, 985. 80
Expenses (of which \$45,500 was for salaries), 1878.....	53, 339. 43
Deficit.....	33, 353. 63
Salaries of telegraph operators and officials, not including messengers, etc., 1898.....	57, 449. 88

The deterioration of the material composing the line in 1898 was as described in Appendix A, Senate Doc. 429, Fifty-sixth Congress, first session. It had been, however, rehabilitated in 1898 to some extent by the Spanish authorities as a necessity for military purposes during the war. It is a fact that has not been brought out clearly, until stated by the Chief Signal Officer of the Army in his report of 1900, that the line might be compared to "a streak of rust and a right of way." The Chief Signal Officer of the Army pertinently adverts to the service of the line before the Spanish war. If the whole truth were told, the fact that the telegraph was operated in conjunction with the mail service gave opportunity for using the mails as the means of transmission instead of the wire. I am told that messages filed for transmission have been sent by mail to the operators at the destination office and there copied on a receiving blank and delivered as a telegram to the party addressed.

The work done before the cyclone of August 8, 1899, was in the nature of general repair, consisting of much less wire and many poles, and included the whole system. After the cyclone demolished the lines they were again restored in any possible way to restore the wire circuits, as is set forth in chapter on "progress of repair work," Appendix A, same report. The value of these military lines is practically their cost when rebuilt, which work commenced in December, 1899, and without considering transportation, which was furnished by the Quartermaster's Department, is as follows:—

Rio Piedras to Ponce, two wires on cross-arm, 118 kilometers, at \$96.14 per kilometer.....	\$11, 344. 52
San Juan to Rio Piedras, two wires, but no cross-arms, 12 kilometers.....	1, 152. 59
Ponce to Playa de Ponce, one wire, 4 kilometers.....	331. 84
Aguadilla to Camuy, one wire, 38.6 kilometers (actual)	3, 202. 98

Yauco to Mayaguez, one wire, 48 kilometers.....	\$3,982.08
Rio Piedras to Humacao, via Fajardo, one wire, 84 kilometers.....	6,968.64
Fajardo to Fajardo Light, one wire, 8 kilometers.....	663.68
Total (442.6 kilometers wire).....	27,646.03
Lines and poles (not reconstructed):	
Ponce to Arroyo; Caguas to Humacao; Aguadilla to Lares; Mayaguez to Las Marias; Aibonito to Barros, 178 kilometers, which has been repaired and used, value estimated at one-half of other.....	7,383.44
Wire only on railway:	
San Juan to Camuy, 106; Ponce to Yauco, 32; Aguadilla to Mayaguez, 48; in all 186 kilometers.....	1,264.80
Total (806.6 kilometers).....	36,295.27

STATEMENT OF RECEIPTS AND DISBURSEMENTS ON ACCOUNT OF UNITED STATES TELEGRAPH LINES IN PORTO RICO, FROM OCTOBER 18, 1898 (DATE OF SPANISH EVACUATION), TO FEBRUARY 1, 1901 (DATE GIVEN TO INSULAR GOVERNMENT OF PORTO RICO).

Received as tolls on commercial messages, sales of instruments, etc.....	\$45,390.64
Disbursed in maintenance and repair.....	28,639.32
Turned into United States Treasury.....	16,751.32
Total received, also disbursed or transferred.....	45,390.64

DISBURSEMENTS IN PORTO RICO ON ACCOUNT OF SIGNAL CORPS FOR OPERATION AND MAINTENANCE OF SIGNAL CORPS TELEGRAPH, HELIOGRAPH, SIGNAL, AND TELEPHONE COMMUNICATION FROM OCTOBER 18, 1898, TO FEBRUARY 1, 1901.

Expense.

Pay of signal soldiers as operators, etc.....	\$58,806.23
Subsistence of signal soldiers.....	31,717.75
Quarters for signal soldiers.....	14,820.11
Transportation of supplies, material, etc.....	14,797.56
Total charge to appropriations.....	120,140.65

Receipts and services and property.

Turned into the United States Treasury.....	\$16,751.32
Value of Government free service rendered.....	77,298.76
Value of new telegraph plant turned over as a gratuity to the island of Porto Rico (constructed by the Signal Corps, U. S. A., after the entire destruction of the original system by cyclone of August 8, 1899).....	36,294.27
Total.....	130,344.35
Deduct total charge to appropriation.....	120,140.65
Total profit, exclusive of all expenses.....	10,203.70
Respectfully submitted.	

W. A. GLASSFORD,
Major, Signal Corps, United States Army.

Table showing Signal Corps stations operated in Porto Rico from October 18, 1898, to February 1, 1901, showing months in operation and average amount of commercial receipts.

Station.	Months in operation.	Average line receipts per month.	Station.	Months in operation.	Average line receipts per month.
Albonito.....	28	\$19.04	Lares.....	28	\$15.45
Adjuntas.....	23	19.09	Las Marias.....	12	5.07
Aguadilla.....	25	73.09	Los Banos.....	4	6.86
Arecibo.....	24	76.04	Manati.....	23	14.76
Arroyo.....	28	35.26	Maunabo.....	4	12.20
Barceloneta.....	3	9.20	Mayaguez.....	28	171.80
Barranquitas.....	9	7.37	Morovis.....	1	1.46
Barros.....	9	11.14	Naguabo.....	4	9.49
Bayamon.....	9	5.49	Patillas.....	2	5.02
Cabo Rojo.....	1	1.47	Ponce.....	28	226.07
Caguas.....	28	32.84	Port Ponce.....	20	112.28
Camuy.....	3	12.23	Quebradilla.....	1	3.48
Carolina.....	9	8.03	Rio Piedras.....	28	6.27
Cayey.....	28	26.92	Salinas.....	23	9.20
Ceiba.....	1	.63	San German.....	24	13.36
Ciales.....	9	11.02	San Sebastian.....	3	14.08
Coamo.....	27	26.75	Santa Isabel.....	3	1.35
Corozal.....	6	2.67	San Juan.....	28	523.15
Fajardo.....	28	49.48	Santurce.....	5	3.80
Guayama.....	28	49.83	Toa Alta.....	3	2.44
Humacao.....	28	102.30	Utuado.....	9	50.92
Isabela.....	3	1.83	Vieques.....	26	18.00
Juana Dias.....	15	12.04	Yabuco.....	5	15.26
Juncos.....	3	4.66	Yauco.....	28	28.56

APPENDIX No. 8.

REPORT OF LIEUT. COL. JAMES ALLEN, SIGNAL CORPS, ON SIGNAL CORPS OPERATIONS AND MILITARY TELEGRAPH LINES AND CABLES IN THE PHILIPPINES, WITH EXTRACTS FROM MONTHLY AND OTHER REPORTS AND STATISTICAL TABLES.

HEADQUARTERS DIVISION OF THE PHILIPPINES,
OFFICE OF THE CHIEF SIGNAL OFFICER,
Manila, P. I., August 20, 1901.

SIR: I have the honor to submit the following report on the operations of the Signal Corps for the fiscal year ending June 30, 1901:

At the commencement of the year 3,000 miles of land line and cable were in operation in the Philippines. The permanent construction for the year adds 2,054 miles to the system of land lines and 539 miles to the cable system, a total of permanent lines on July 1 of 5,600 miles.

On July 1, 1900, there were 315 telegraph and telephone offices and 135 local telephones, a total of 450 offices directly connected with Manila. At the end of the fiscal year there were 340 telegraph and telephone offices connecting detached posts, and in addition 360 local telephones were in use, a total of 700 offices, only 10 of which were not in communication with Manila and a part of the general system.

Since the end of the year the cable system has been extended 234 miles, and there is now being loaded on the cables, which will leave in a few days, enough cable to connect Albay and Bacon; Sorsogon, Luzon, with Palanoc and Calbayoc; Maasin, Leyte, with Surigao, Mindanao, and probably Jolo with Siasi, if it is decided to connect that point. This work when finished will complete the military system from Aparri and Cape Bojeador at the north end of Luzon as far south as Jolo or Siasi, and connect all the principal islands of the archipelago in the division by military lines, except Panay, which is reached by three distinct cables of the eastern extension, Australasia and China Telegraph Company's lines. The system will then consist of 4,881 miles of land lines and 1,232 miles of cables, a total of 6,113 miles.

About 10,000 messages per day have been received, sent, and relayed during the year, this representing 3,000 messages delivered daily, the words actually transmitted amounting to 100,000 for each day of the year. On the 6th of August, 1901, 134 offices were opened to commercial business, and on September 1 69 additional stations will be added to the list.

Reports of line destroyed cover 391 miles, the largest amount reported destroyed being on the island of Bohol, where the entire system was temporarily abandoned.

Cebu reports 25 per cent and Leyte 25 per cent destroyed, the other districts showing a lower percentage.

The appended tables bearing on land and cable construction, miles of line and messages handled, report of enlisted strength, and map of military lines in the Philippines supplement the above statements, and give a better idea of the work performed by the Signal Corps in the Philippines.

The following are the reported casualties for the year:

Second Lieut. John Kennedy, accidentally killed; First Lieut. William E. Davies, wounded in action.

Killed in action.—Sergt. Albert H. Cockayne, Company E; Sergt. Warren Billman, Company F; Sergt. Ludlow F. North, Company E; First-Class Sergt. Robin J. Todd, Company F; Corp. Charles A. Wilson, Company H; Private William B. McElhager, Company F; Private George E. Patton, Company E.

Died in the Philippines.—First-Class Sergt. Marshall S. Greene, Company E; Sergt. Joseph A. Drouin, Company F; Private William F. Stevens, Company F; Private Elmer E. Roelhorn, Company H; Private John B. Tracy, Company F; Sergt. James H. O'Donnell, Company H.

Of the Filipino linemen, 12 were killed, 1 drowned, and 6 captured.

There are now on duty in the Philippine Islands 1 field officer, 3 captains, and 8 lieutenants, 2 being sick in hospital.

The number of enlisted men has been fixed at 534, but it will be with great difficulty that this number of men can be maintained. During the period of active operations about 40 per cent of the men actually discharged by expiration of service reenlisted; at the end of December 55 men will have been discharged by expiration of term of service, and during the following six months 165 additional, and only a very small percentage are reenlisting. Only 27 men have been received direct from the United States since February.

To provide for any emergency that may arise the division commander directed by order No. 220, August 17, 1901, that an enlisted man of the line be detailed at each office outside of Manila for instruction.

It has also been proposed to establish schools for the training of natives. They should be especially encouraged, as the telegraph service will furnish employment within the next two or three years for 1,000 Filipinos, if they can be properly educated. Two hundred natives are now employed as linemen and otherwise, and their ability to make excellent linemen and repairmen has already been established, and there seems but little doubt that a number, with some training, will make good operators.

The material sent out from the United States has been ample in quantity and generally of superior quality. There have been some losses in transshipment, but owing to the facilities for watching shipments the amount has been small.

The supply of material on hand is ample, and the expense under this head will not be as large this year as last, as the lines are rapidly reaching the extent to which they have been projected.

No material reduction can probably be made in the number of miles of line, even if garrisons are consolidated, as there will be a demand for offices for use of the civil government. Lines are being extended conservatively, and it is not expected there will be any great increase in the amount during the year.

There is transacted a very large amount of official business, and with the establishment of various offices under the civil government it is constantly increasing. Until better mail facilities can be established a large amount of telegraphing is absolutely necessary by both civil and military governments.

Very respectfully,

JAMES ALLEN,
Lieutenant-Colonel, Signal Corps, United States Army,
Chief Signal Officer, Division of the Philippines.

EXTRACTS FROM REPORT OF LIEUT. COL. JAMES ALLEN, SIGNAL CORPS, CHIEF SIGNAL OFFICER, DIVISION OF THE PHILIPPINES, ON SIGNAL OPERATIONS AND MILITARY TELEGRAPH LINES AND CABLES IN THE PHILIPPINE ISLANDS, WITH EXTRACTS FROM MONTHLY REPORTS, AND WITH STATISTICAL TABLES.

MANILA, P. I., May 15, 1901.

At the end of July, 1900, there were in operation in the Philippine Islands 2,931 miles of land telegraph and telephone lines and 210 miles of cable belonging to the United States Government and operated and maintained by the Signal Corps of the Army. This system, the outgrowth of military necessities and primarily for the use of the Army alone, had been built of American material, without regard to the old

Spanish lines, which had practically disappeared during the disturbances that preceded and followed the American occupation of the archipelago. At this time the telegraph system, which had extended as far as military occupation, was taking permanent form, hastily constructed field lines laid on bamboo or bonga poles were now being replaced by hard native wood, strung with No. 9 wire on standard insulators. New lines were laid as insurgent districts became quieted, but there still remained an extensive system to construct and many miles of temporary line to replace before the land communications of the Philippines could be considered as approximately complete. The cable system in July, 1900, was at its beginning, for with the exception of the cable from Cebu to Ormoc (island of Leyte) no Government lines had been laid south of Luzon.

Four hundred and fifty telegraph and telephone offices had been opened, and 25 officers and 350 men were available for the maintenance, management, and extension of the system. With so small a force—less than one man to each office—it is evident that it was only by the most strenuous exertion that the system could be maintained at all. That it was maintained, and with efficiency, during the storms of the rainy season, and against the constant attacks of the insurgent troops was chiefly due to the fact that the efforts of the officers were supplemented by the energy, courage, and intelligence of the enlisted men of the Signal Corps, each individual of which seemed to identify himself with the work of the corps. Still, so scant in number was the personnel, that when the call came for a detachment of the Signal Corps to proceed in haste to China, it was with great difficulty and to the detriment of the Philippine service that 2 officers and 12 men were spared to accompany the relief expedition to Pekin. Later in the year more men were sent for telegraph work in the Philippines; but I desire here to call attention to the fact that at no time within my experience has the enlisted force of the Signal Corps in these islands been sufficiently strong to permit the men to perform a reasonable amount of duty. Even after the days of stress had passed, the men of the corps were of necessity worked until many of the ablest and strongest were broken in health, and even after that were compelled to work on until forced into the hospitals or to return home. Indeed, at the present time, when peace appears to be assured, military telegraph operators are required to remain twelve hours each day in their offices (including Sundays and holidays), and to be at all times within call of their instruments. In a hot and trying climate the hardship of such duty, performed not merely for a few days at a time, but day after day, without intermission for months together, seems evident. Yet no relief can be given to these men unless an adequate force be provided for service in these islands.

Advice was received in July of the death of Corpl. Martin A. Dillon, Company E, Signal Corps, en route to the United States hospital at San Francisco, Cal., and on August First-Class Sergt. Marshall A. Greene, Company E, and Sergt. Joseph A. Drouin, Company F, died at station where they were assigned to duty. All of these men have done excellent work, and their death is a loss to the service.

In July, 1900, the insurgents were still very active, but in spite of this and of the violent storms of the rainy season communications were maintained, old lines were repaired, and new constructed. In northern Luzon the telegraph system of the province of Ilocos Sur suffered severely from the enemy; wires were cut, large sections removed, and poles destroyed. On the 11th of the month Sergt. Warren Billman, Company F, Signal Corps, while en route with telegraph supplies from Vigan, accompanied by an escort of 17 men from the Twelfth Infantry, was killed by the insurgents, who ambushed the party and captured the supplies; in Pampanga lines were destroyed, and in Nueva Ecija frequent interruptions by storms or by the enemy caused much annoyance. During the month, in northern Luzon alone, the lines were cut on thirteen different days, many poles were chopped down, and nearly 6,000 yards of wire removed by the insurgents. First Class Private William B. McElhager, Company F, Signal Corps, was either killed or captured on the 16th of July, from which date he has been "missing."

In August considerable difficulty was experienced in northern Luzon from the high winds and heavy rains, and, indeed, nearly all the lines in the island were for a time interrupted. Similar difficulties were experienced in September, when a severe typhoon, which raged for three days, prostrated nearly all the lines of the department, and the heavy accompanying rains flooded the country, making all but temporary repairs impossible for several days. Even to accomplish these repairs men were compelled to work in water from waist to shoulder deep. In addition to these difficulties, the lines were cut thirty-five times in the department during the month of September alone, and in some places were interrupted faster than they could be repaired. However, a few miles of new construction were added and six new telephone and telegraph offices opened. In October similar conditions existed, and if interruptions from storms were less frequent the insurgents were persistent in their

efforts to injure the lines, especially in the provinces of Ilocos Sur and Nueva Ecija. Twenty-eight instances of cutting occurred. Four new telephone and telegraph offices were opened during the month and one telegraph office was closed.

In November, with the subsidence of the rains, much activity was shown in the repair of lines of northern Luzon weakened during the wet season. A very marked falling off in the interruptions caused by insurgents was experienced; nevertheless, twelve instances of cutting occurred, and on November 14 a repair party under First-Class Sergt. Robin J. Todd, Company F, was attacked near Amulung and Sergeant Todd killed. His body, supposed to have been thrown into a neighboring river, was not recovered. During the month 40 miles of line were reconstructed and 10 miles of new line built. Various river cables injured during the floods were also repaired. Three new telegraph and twelve telephone offices were opened, and three telegraph offices closed.

The cessation of the rains in December permitted a general cleaning up of the telegraph systems of Luzon, and the tireless activity of our troops gave the insurgents very little time to amuse themselves with the cutting of lines, and but five interruptions occurred in northern Luzon during the month. A large amount of repair and construction work was performed, and the strong new line of six wires which now follows the railroad from Manila to Dagupan was commenced, under charge of Lieutenant Nordquist, whose work was remarkably well done. Six telephone and telegraph offices were opened, and the same number were closed during the month.

During January, 1901, similar conditions existed, and the work of replacing temporary poles with those of hard wood, and of pushing on the railroad line was continued. Interruptions by the insurgents had ceased to be either frequent or serious, although eight attempts were made to cut the lines, and about 2 miles of wire were carried away. One telegraph office was opened, one telegraph and one telephone office closed.

In February about 100 miles of line were replaced with hard wood, and 40 miles of poles set, and 270½ miles of main line were strung on the Manila-Dagupan line. In addition, several new telephone lines were built and installed. It became necessary, on account of lack of operators, to convert five telegraph offices into telephone stations, in spite of the fact that the telephone is far less satisfactory, besides being less under control, than the telegraph. Two new telephone offices were opened and one telegraph and one telephone office closed.

During March much construction and reconstruction work was accomplished in northern Luzon. Ninety miles of line were replaced with hard-wood poles; 23½ miles of new telephone and telegraph line were built; 27½ miles of poles were erected; and 270 miles of wire strung on the main telegraph line between Manila and Dagupan, and seven new offices opened up on that line. Four malicious interruptions occurred. Two new telegraph and two new telephone offices were opened, and one telegraph office closed during the month.

In April about 50 miles of line were rebuilt in northern Luzon; the new telegraph line from Manila to Dagupan was completed, and 90½ miles of telephone line were constructed. One telegraph and eleven telephone offices were opened, and two telegraph offices closed. Interruptions were insignificant.

There are a few miles of bamboo-pole line left, but these are being removed or replaced as rapidly as proper economy will allow.

Of the enlisted men the signal officer of the department says:

"With very few exceptions the enlisted men are sober, industrious, intelligent, and enthusiastic concerning the success of the work to be done by the Signal Corps. * * * The health is, however, not as good as could be desired, especially of operators. The long hours of their day's work and lack of exercise are telling on those who have been here over two years. A number of men are now on duty who are entitled to, and should be allowed, a rest of some kind, but under existing circumstances their services can not be spared. In spite of this there are few complaints.

In southern Luzon during the rainy season still greater difficulties had to be overcome by the repair parties who worked often in heavy rains, through dense jungles, in flooded rice paddies, or in swamps with water at times reaching to the armpits. In this department, in spite of the season, communication was completed between Guinayangan and Lucena via Lopez, and the telegraph pushed through to Tayabas which was later connected by a permanent line with Calamba. Much reconstruction work was accomplished. On the third of the month, as the signal officer of the department reports "The first wire cutting began near Candelaria on the Tayabas line; from then on scarcely a day passed during July that the lines were not cut either here or south of Santa Cruz, or between Lucena and Atimonan. A report from the lineman at Majayjay, received during July, shows that in the last two weeks of July not a day passed without a line being cut and more or less destroyed on both sides of that place."

After one of these interruptions Sergt. Albert H. Cockayne set out to repair the line and was killed. The report of the affair says:

"On July 18 the line went down between Cabuyao and Calamba. Sergt. Albert H. Cockayne, lineman at Calamba, set out in the usual energetic fashion to repair same. Unfortunately the delay in furnishing him escort caused him to go out with only one assistant detailed from the infantry. At the barrio, midway, where the break was, they were fired upon and the helper's horse killed, the helper escaping in the thicket after having seen Sergeant Cockayne fall in the road, as if badly wounded. Sergeant Cockayne's riderless pony ran back toward Calamba, thus giving the alarm at Calamba, and a mounted party was sent out, who found the helper but not Sergeant Cockayne. Another energetic lineman, Sergeant Mueller, had been approaching from the north, was fired upon, but got through to Calamba. He went back and succeeded in finding the body of Sergeant Cockayne, pierced with several bullet wounds."

On the same date Corporal James proceeded with a detachment to repair the line near Magdalena. The detachment was ambushed by a large force of insurgents, but the sound of the firing brought up a body of troops from the south, and about the same time Corporal James, by means of his field telephone, got word to the commanding officer at Santa Cruz, which quickly brought out a cavalry detachment who attacked the insurgents from the east. The surprise was complete, and the insurgents were driven off the field.

In the province of Albay the state of affairs was discouraging, owing to the activity of the insurgents; and the lines in Batangas, Laguna, and Tayabas provinces were cut almost daily. Nevertheless, communication was completed between Manila and the Camarines, and extensive reconnaissances made in that province as well as in Albay, permitting the beginning of reconstruction work in the region north of Legaspi, toward Nueva Caceres and Tobacco. One additional office was opened.

In the city of Manila the month of July practically marked the completion of the city telephone lines and the complete installation of the telephone central office. Seven new offices were installed.

The latter part of the month of August was very stormy in southern Luzon. A triple typhoon, accompanied by terrific rains, worked great havoc with the lines. Credit is given by the signal officer of the department to the linemen for their energy, and especially for swimming swollen rivers in the performance of their work. During the month the cable party was called out four times to repair the line between Calamba, Los Baños, and Santa Cruz. During August 75 miles of line were reconstructed.

On September 2, Sergt. Ludlow F. North, Company E, Signal Corps, went out from Binan with an escort of 10 men and a native lineman to repair the telegraph line. The party was fired upon by insurgents in ambush, and Sergeant North fell from his pony mortally wounded, and was later boloed. The native lineman escaped to Binan.

On September 7 the most severe typhoon for several years passed a short distance north of Manila. The signal officer of the department reports that "the city lines stood the fierce winds perfectly."

By the 8th Manila was cut off by the tremendous rain and wind. The typhoon subsided on the 9th, and by noon of the 10th the lines were practically restored. The following copy of a letter, written by the commanding general of the department to the signal officer, shows that the work of Company E was noticed and appreciated:

HEADQUARTERS DEPARTMENT OF SOUTHERN LUZON,
Manila, P. I., September 12, 1900.

SIR: I have the honor to invite your attention to the fact that although the recent typhoon created great havoc among the telegraphic lines of this department, to such an extent that on the evening of September 9 telegraphic communication between Manila and the rest of the department was absolutely cut off, the lines were repaired and in working order by 2.20 p. m. on September 10 as far as Naic, in Cavite province, and Lucena, in Tayabas province. They since have been completely restored.

This reflects great credit upon the linemen of the Signal Corps, who are working under tremendous difficulties; and it also is most creditable to Capt. Edgar Russel, whose work as signal officer of this department has been uniformly characterized by energy, industry, and ability.

I respectfully request that this communication be forwarded through military channels to the Chief Signal Officer of the Army.

Very respectfully,

J. C. BATES,

Major-General, United States Volunteers, Commanding.

The ADJUTANT-GENERAL,
Division of the Philippines.

During the month of September, in addition to the interruptions caused by storms, there was much line cutting by insurgents. Two attacks on repair parties are reported by the signal officer of the department.

During the month about 17 miles of line were rebuilt and 18 miles of cable laid in Laguna de Bay, where the small copper cable between Calamba and Santa Cruz had become so leaky as to be irreparable and was replaced by deep-sea cable. This was coiled on a large lighter, testing apparatus was installed, and under the escort of the gunboat *Florida* was laid from Calamba to Santa Cruz, a distance of 18 miles, in five and one half hours.

In October the same party continued cable laying from Santa Cruz to Siniloan and from Calamba to Los Banos, 12½ miles in all, thus completing the new cable communication between the lake towns mentioned.

Under date of September 25 a letter was received from the officer commanding at Cabuyao as follows:

"I have the honor to inform you that Corpl. Jesse F. Mingea, who was operator at this station on the occasion of a night attack by insurgents on Cabuyao, P. I., September 14, 1900, is a brave soldier. This attack came with scarcely any warning. He had previously been ordered in case of an attack to make every effort to call for assistance before leaving the office, and the manner in which he obeyed this order under such trying circumstances is worthy of more than passing notice. During the entire engagement of about thirty minutes he, in the second story of a bamboo house, bullets flying all about him, stuck to his post until he succeeded in notifying both Binan and Calamba of the attack and asking for assistance.

On October 1 an officer, 6 men of the Signal Corps, accompanied by 60 Chinese coolies as bearers, and equipped with 80 miles of light wire (30 miles of bare copper wire and 50 miles of stranded insulated wire), 4 type "D" kits (buzzer), and other instruments and supplies for rapid fieldwork, left Manila by casco and launch for Siniloan to accompany an expedition leaving that place for Binanhanon, on the Pacific coast of Luzon. The intention was to keep this expedition in touch with Siniloan and of course with Manila. Military necessity, however, required that the coolies be turned over for service with column. As without transportation the signal party was useless, it returned to Manila.

During the month of October only 6 cases of line cutting were reported. This great falling off in number of malicious interruptions was partly due to the abandonment of the often-disturbed lines near Santa Cruz and partly to decreased activity on the part of insurgents elsewhere. Many troops were temporarily withdrawn from the region about Santa Cruz, for which reasons lines for a short time were abandoned.

Twenty miles of line were built or reconstructed during the month and 24 miles of cable were laid.

The month of November was marked by the death of Lieutenant Kennedy, of the Volunteer Signal Corps, a valuable and accomplished officer, who was killed near Gerona, province of Tarlac, in a collision on the railway, November 24. Otherwise the month passed without special incident. Thirty-eight miles of line were constructed and thirteen and a fraction rebuilt. A long-distance telephone service was established between Manila and the coast towns as far as Naic, about 40 miles, and 9 additional telephones were installed in the city system of Manila. The line between Pagbilao and Tayabas was reconstructed during the month. The party suffered continually from fever. In his report the department signal officer calls attention to the fact that "from Tayabas to Lopez is one of the worst fever districts our men have ever had to work in. Frequently long interruptions of the lines are inevitable, not only from the difficult character of the country and storms, but also on account of the sickness of all Signal Corps men. This is especially true of Atimonan."

During the month of December there was much activity in line building in southern Luzon, 85 miles of line being constructed. In the Camarines and Albay provinces there was much cutting by the insurgents, but steady, if slow, progress was made in pushing the line from Legaspi over the difficult country northward. In Cavite province a portion of the Manila-Naic line was reconstructed. On the 23d of the month the cable ship *Burnside* left Manila under command of the chief signal officer to lay cable in the southern islands. The city telephone system was increased by 9 instruments.

In January the system was increased by 6 new phones, and the work of replacing the old Bell telephones (which were of course rented, not owned, by the Signal Corps) commenced. An elaborate intercommunicating system was placed in the First Reserve Hospital. In the Camarines the line from Nueva Caceres to Legaspi was completed, but continual patrol was required on account of the insurgents, who for a time amused themselves by cutting the wires three or four times a day. The work of reconstructing the line between Atimonan and Guinayangan was much

delayed by sickness of enlisted men and natives, as well as by the difficult character of the country. A clever piece of work is thus reported:

"The line having gone down between Tabayas and Atimonan, Sergeant Barrett, after gathering up all messages received at Atimonan from towns south for relay to towns north, proceeded along the line toward Tabayas, cut in with 'buzzer' on top of mountain between Atimonan and Tabayas, and cleared with Tabayas."

In Cavite and Laguna provinces much reconstruction work was done. During the month 14½ miles of new line were built and 56 miles reconstructed.

In February, 1901, the telephone system of the city of Manila continued to grow; 6 new instruments were installed. In the Camarines and Albay much reconstruction work was performed. Line cutting was frequent between Ligao and Guinobatan, but repairs were promptly made. The immense number of messages continually going over the wires, and the delay caused by operators at stations between Santo Tomas and Taguig who were compelled to hold messages because the wire was in use, necessitated a second wire between these points, which was placed in position during the month. In Laguna province much building was done, and the work on the Manila-Naic line was completed. Forty-seven miles of new line were built and 52 reconstructed.

In March the rebuilding of the city lines of Manila commenced and the telephone system increased by 5 instruments. On account of the departure of the Forty-fifth and Forty-seventh Infantry, United States Volunteers, from the third district, it was found necessary to change several of the telegraph offices to telephone offices, as a number of these organizations had been on duty as operators with the Signal Corps. There was still some interference with the telegraph. A party under Lieutenant Wheat in the neighborhood of San Juan de Boc Boc was attacked on March 23, and one man of the escort was killed and one other is reported missing. The number of insurgents making the attack was estimated at 100 men, all armed with rifles. On March 3 also a party consisting of Sergeant Cuzzort and Privates Graves, Patton, and Speer, with 25 natives and an escort of 6 men, while returning from Indang to Manila were attacked near Salang. The insurgents allowed the advance guard to pass, and when the first wagon containing part of the detachment was within 30 or 40 yards of them fired, killing a quartermaster-sergeant of the Forty-fifth Infantry and Private George W. Patton, Signal Corps, wounding 2 native linemen; 4 mules were also killed. During the month fifty-nine and a fraction miles of new line were built and 52 reconstructed.

During the month of April 8 telephones were added to the Manila local system, making a total of 90 instruments. A subcentral was established at the office of the depot quartermaster consisting of a 20-drop switchboard. An intercommunicating system of 6 telephones was established at Hospital No. 3. The reconstruction of the city system was completed to outlying points. A new telegraph wire was run to Pasig. The number of miles of line constructed during the month was 57; reconstructed, 25. There was but 1 case of interruption.

DEPARTMENT OF THE VISAYAS.

This department, which consists of four districts and the subdistrict of Bohol, has made great progress during the past ten months. The signal officer reports regarding the island of Panay that—

"The 1st of July found a very discouraging state of affairs on the island of Panay. The post at Passi, which was the key point for the lines connecting the north and south halves of the island, had been abandoned, and it was therefore impossible to maintain the section between Dumarao and Pototan, a distance of 32 miles. The temporary line of insulated wire connecting Pototan and Banate had also been completely destroyed and carried away, while on the west side of the island all but 6 miles of the line connecting San Joaquin and San Jose had been completely destroyed. When the hopelessness of extending the lines became apparent, the building squad was disbanded temporarily and its members distributed through other districts where the work was going forward and new lines were being built. Only sufficient men were retained on Panay to take care of the lines then established and to build a new telephone system for Iloilo, Molo, and Jaro. There were at this time but 16 telephones connected with an antiquated switchboard in the central telegraph office. The system ran through the city on small rotten poles, and had grown up with the provisions for future extension. For these reasons an entirely new system was built on large hard-wood poles with cross arms, and a route so chosen that all the lines could leave the office in a cable and be distributed through the city by a trunk line. A new and modern 40-drop switchboard arrived at this time, and the system was entirely completed before disturbing the old line. The changing over from one sys-

tem to the other was accomplished in a night without interruption to the communication. The old system was then removed and the hard-wood pole line was extended to Jaro with 4 wires and to Molo with 1 wire."

The system as now established has 24 wires, none of which is overcrowded, and is giving excellent service. Outside of the occupied towns the conditions of the island remained about the same during the months of September, October, and November. The existing lines were maintained during this period with much difficulty. The work of repairing breaks, keeping up the supplies, and furnishing the necessary guard was very trying to all concerned. There were times during these months when it was necessary to call for a new guard before the one previously sent out had returned to its station. A number of officers of the Twenty-sixth Infantry had had experience with telegraph work, and took a great deal of interest in the lines. Among these should be mentioned Lieut. Max Wagner, who often relieved an overworked operator at night, and who was killed by the insurgents near Pavia while making an inspection of the line at the request of the department chief signal officer. On the arrival of the Thirty-eighth Infantry in December preparations were immediately made to put a number of columns of infantry in the field and to clean up the strongholds of the enemy. More Signal Corps men were received at this time and signalmen were detailed with each column that applied.

The columns were also supplied with flags, heliographs, rockets, and field glasses. In each case favorable reports of the signal work were received. The concerted movement of the troops commenced on December 10, and on December 11 an officer and 7 men with all the necessary material were dispatched to rebuild the line and to reestablish communication as fast as the movements of the troops would allow. Between December 7 and 25 the lines between Capiz and Iloilo, including all the branches, were thoroughly repaired and put in such good condition that no leaks could be detected. On the 27th of December active operations were inaugurated in Antique province, and it was deemed advisable to try to get into communication by permanent lines with the west coast. Company I of the Sixth Infantry was detailed to the chief signal officer to act as escort and the steamship *El Uno* was turned over to carry the material and men for distribution wherever it was considered most advisable to land. No instructions were given beyond the order to put up the line. It was intended to land 40 men at Tiolas with material to build 20 miles of line and to send the remainder of the company to the other side of the pass with the rest of the material and rations. This detachment was also to scout through the pass and surrounding country for 10 miles in all directions, and to employ natives to cut poles and distribute them as far as possible into the pass. The Tiolas Pass was chosen as the route from the east coast to the west coast on account of its shorter distance and because the most active operations had taken place in that vicinity.

A few days before this a detachment of mounted men from the Thirty-eighth Infantry had been attacked while crossing this pass, and had been obliged to keep up a running fight for several hours. On reaching the vicinity of Tiolas, however, the high surf compelled a landing at San Joaquin, where 40 men and supplies intended for Tiolas were disembarked in very rough water. The construction party with a guard of 10 men reached San Roque the first night and took the wire 1 mile into the pass at the end of the second day, coming back to Tiolas the second night. On this night a runner arrived at San Joaquin at 2 o'clock and reported that 150 men had attacked our party and completely annihilated it. This report was untrue, but caused some anxiety in Iloilo until we announced our presence on the wire the next morning. The foundation for this report probably lay in the intention of an armed party of insurgents to surprise us in the guise of cargadores and bull drivers. I had called upon the presidente to furnish me with 100 natives, and he came to me at 7 o'clock and said that he had sent off to the neighboring town, and requested permission to bring them into camp about midnight. I refused this permission and told him they could camp on the opposite side of the river when they arrived, but any attempt to cross the river would be considered a sufficient excuse for the guard to fire. The next morning the presidente led in but 20 men, saying that he could not get the rest. We put up 5 miles of line and transported all the supplies a mile beyond, camping on the outskirts of the barrio Totogo. Every man from Tiolas was paid off and sent away from camp that night. The next day 5 miles more were constructed and the same requisitions made on the presidente of Domon. Up to this point the line had been No. 14 wire, strung on hard-wood poles. From this point to Apo the trail was exceedingly bad through a trail covered with dense growth of bamboo, and insulated wire tied to insulators and hard-wood poles was used. The distance covered was about 3 miles. On the sixth day Guintas was reached, which is the opposite terminal of the pass. A detachment of 20 men was sent back to Tiolas, and the men were utilized to build in to San Jose. We were able to put up 9½ miles

of the best line in the island between the hours of daylight and 9 o'clock in the evening, at which hour the office was cut in at San Jose and the line reported finished to the commanding general at Iloilo. Before the end of April the line had been extended from San Jose to Sibalon and also along the entire west coast to Pandan. Since then the line on the north coast has been extended to Ibajay and is under construction to Pandan.

ISLAND OF NEGROS.

On account of the temporary peaceful conditions which have existed on this island more actual building line has been accomplished than in any other district except Panay. July opened with the line connecting Dumaguete and Bais. This line was completed to Bais on July 31 and both it and Dumaguete put in connection with the department headquarters by means of the heliograph and flash lantern stations connecting with the main system in Cebu. On reaching Bais it was decided to place a garrison at Guijulungan, on that coast, and to extend the line to that point. Escalante on the north line and Danao, its seaport, had been reached only July 3. On account of the roundabout way, which included cable tolls, by which it was necessary to send messages from the district headquarters to these stations on the west coast, it was decided to extend these coast lines either through the pass connecting the east and west coasts or on to Escalante. The second method would have necessitated a very long circuit and it was therefore decided to run the line through the pass from Isabela to Guijulungan, a distance of 31 miles. The district signal officer was therefore ordered to put it in without delay. Material was sent to Isabela and an expedition composed of Lieutenant Clifton, Signal Corps, 8 engineers, and 15 men of the Ninth Infantry was organized. The expedition was furnished with a guide and 18 pack animals. The first day from Isabela (I quote from report of the officer in charge) we entered a forest at 2 p. m., and did not come out until 3 p. m. the next day. It was very dense, the trail so narrow that we had difficulty in getting packs through and so steep that we had reached 2,000 feet altitude six hours after starting, and frequent stops had to be made to cut footholds for the animals. During the next day's march a native living on the trail said that it was impossible for animals beyond that point. A side trail, however, leading to San Jose, was followed and that point reached in five days from Isabela. The last three were ones of continual climbing up and sliding down again over almost perpendicular mountains. Six of the pack animals had died. The people at Guijulungan informed me that the pass over which I had just come was never used with animals, but that there was a trail between Valle Hermosa and Castellana. The department signal officer was informed of the situation and immediately ordered the line to be extended to Valle Hermosa on the east coast and from there to Castellana by what was called the volcano pass. This change upset all previous distribution of material and resulted in the illness of 2 men from fever, the death of 6 carabaos, and a delay of ten days at a time when it was desired to get through that section of the country with all possible speed. The march back to Castellana was ordered over the volcano trail, as it was thought better to rely upon our own observations than upon reports in the future. Castellana was reached again over this route on November 26, much of the marching being done by night as well as by day. During this time the work on the east coast was being done as rapidly as could possibly be done with one Signal Corps man and native labor with directions to have line in Valle Hermosa by the evening of December 15.

On November 24 supplies had been moved back to Castellana and the line was commenced to Valle Hermosa. From then until the 13th of December many difficulties were overcome and an excellent line put up. On the same day that we arrived at Valle Hermosa, Sergeant Collins came in with the line two days ahead of time, having put up 5 miles of line on the last day. As soon as the instrument was connected the completion of the line was reported to the department signal officer and the adjutant-general over the new line. The commanding general immediately sent a telegram to Dumaguete over this route and received an answer in three hours. Since that time there has been little trouble on this line.

In February the city telephone system of Bacalod was changed to hard-wood poles and repairing done on the lines from Bacalod to Jimamaylan and in April the line was extended 32 miles from this point to Isio on the west coast. By the 1st of May Enrique and San Carlos will have been changed to telephone lines in order to make two extra operators, one for Isio and one for Bais which I have temporarily closed for the purpose of sending the operator at that point to the Oslob end of the Cebu cable. All the lines in Negros at this date are in thoroughly healthy condition and many more stations which would yield revenue would be opened if we had the operators.

ISLAND OF CEBU.

The beginning of July building of lines south of Argao to connect the projected heliograph station with the station on the island of Negros was commenced. There was much trouble in building this line on account of lack of transportation and natural disadvantages. This line was completed on July 20—34½ miles having been constructed between July 1 and 20. On July 22 regular messages were transmitted by flash lantern and heliograph. This method of communication continued between the two islands until the cable between Dumaguete and Oslob was laid. On March 9 Sambilan was closed and 25 miles of line abandoned. During this trip it rained at least once in every twenty-four hours. Three of the men returned to Cebu ill with fever and the rest had boils and dhobie's itch. The cost for this 55 miles was about \$18 Mexican per mile for transportation and construction. On August 13 the line connecting Guadeloupe with Cebu was finished. On August 20 the line from Dumanjug to Balamban was started, and owing to bad roads, heavy rains, and many accidents the line was not completed until September 24. On the way back to Cebu the Dumanjug line to Sibonga and from Sibonga to Argao was repaired, a distance of 63 miles. On October 18 Serjt. Ferd Hart became totally incapacitated for further duty and two others were transferred to the hospital with dysentery. On November 1 the city telephone line was rebuilt with hard-wood poles and a central station established. On December 4 seven miles of the most inaccessible part on the Balamban line was destroyed and a special squad was sent to repair it.

In January a line was started through the Bogo district, on the north end of the island, over bad country connected by trails only. This was more of an experiment than anything else, and permission was given to put telephones in towns garrisoned by native troops only. The expected has happened, and two of the telephones were used as targets by the insurgents, and upon the withdrawal of the detachment at San Remigio this section was practically abandoned, although it is understood that the line is still intact with the exception of a few miles. On the 3d of February the Ormoc cable was repaired, a time ball for ships in the harbor erected at Fort San Pedro, and changes made in the Cebu office. Six hundred iron poles were received from the *Burnside*, and an expedition started to rebuild the line from Cebu to Argao with these poles. Six hundred more were received later, and the line is now strictly a permanent one from Cebu to Oslob. This makes connection with Manila almost certain, provided the cables are not disturbed, from as far south as Jolo. There have been many interruptions, due to the insurgents, and it has taken much hard work to preserve the lines. Lieutenant Davies, district signal officer, was wounded on March 3, while in command of the advance guard, in an attack upon an insurgent stronghold in the mountains. There were about 33 rifles and 3 small cannon in the barrio, and Lieutenant Davies was shot in the first volley, the ball passing through the left arm and missing the bone by a fraction of an inch. Private Reelhorn of the Cebu detachment was taken ill with dysentery on January 1 and died on the hospital ship *Relief* on the 12th of February. There have been more casualties and much more sickness in Cebu than in any other district in this department. This district, like all the others, has been undermanned and the men greatly overworked.

ISLAND OF BOHOL.

"In July this island was in a state of profound peace, and the lines had reached Tubigon on the north and Tagbilaran on the south. They were carried along evenly as far as Ubay on the northeast coast until August 21. At this time signs of disturbance commenced to show themselves, and from that time on there has been much trouble. A very small force only could be spared for this line, and the four signalmen under charge of Sergeant Carson were compelled to rely largely upon native linemen who they themselves had trained. On September 10, about the same time the insurrection broke out on the adjacent coast of Leyte, one native lineman with his tools was captured and probably killed, and on October 15 two more met the same fate. A fourth was captured some time after, and it became very difficult to obtain natives for that work. There was much cutting during all this time, and as the line had practically been extended as far as was necessary no new building was done. On December 16, the line between Ubay and Jagna having been cut, a detachment of 20 men under Captain Anderson was sent to escort Corporal Wilson, Signal Corps, United States Army, who had charge of that district. While passing through a deep rock cut they were attacked by 300 bolomen. The enemy came in from the front and rear and down the sides of the cut. Two men were instantly killed, 1 died in ten minutes, and 2, including Corporal Wilson, died the next day at Sagna; others were wounded. Nineteen of the enemy were counted dead, 4 of whom were killed by Corporal Wilson, who was slightly in advance. He himself

received 9 bolo wounds. The line was cut 10 different times during this month, and 60 poles were cut down. The garrison shortly after this was withdrawn from Ubay, and on the discharge of Sergeant Mack 3 men only remained to do the work, as another man could not be spared. Since February there has been less trouble, but there is still some cutting. On account of the heliograph at Loon another man has been added, and the island remains at this date with 4 men. The heliograph and flash-lantern communications established by Major Scriven have continued to work satisfactorily, although, of course, with less certainty than a cable. Cables, however, were more necessary in other places, and Bohol has been left with visual and telephonic communications for the present."

ISLAND OF LEYTE.

This island has been the most violently and uniformly disturbed of all the Visayan group during the entire year. On July 1 the line had been extended from Ormoc to Jaro and from thence north toward Carigara. During the month a large section of what had just been built was torn down, and Lieutenant Wallace was ordered to spend no more time or material upon it, but to proceed to Palo and connect the east coast with Tacloban, the district headquarters, for the reason that the garrisons were closer together and afforded more protection to the lines in that section. The entire population had joined the insurgents or was in hiding. A few days before several hundred bolomen had attacked a detachment of infantry near Jaro, and 92 of the bolomen were killed. At another time 4 men escorting Sergeant Stewart of the Signal Corps were killed by the insurgents in the first volley, and Sergeant Stewart escaped from the fact that he was a little distance in the rear on a lame pony. He rode back to the nearest garrison after dismounting and emptying his revolver into the bushes from which the volley had come. Rains were falling every day and the roads throughout the flat country were absolutely impassable. I quote the following telegram from Lieutenant Wallace upon the situation: "The town is practically deserted. Our working party was fired upon yesterday, almost within the city limits. The work required of them is beyond human endurance. Can not I have more men? Any kind of men will do. Have enough operators for the present." (Dates Tacloban.)

By July 28, 28 miles on the east coast had been completed, but Tacloban was as far from being connected with headquarters as ever. In September an attempt was again made to connect Palo and Jaro, but by the time it was completed the insurrection had broken out on the west coast, near Ormoc, where before that time there had been comparative peace. This outbreak carried with it the section from Ormoc to Jaro, which had been built previously. The section was then abandoned for the second time, but in October another attempt was made to connect Palo with Ormoc, which was successful, and the line was kept open for a short time by means of constant patrols. Alang-Alang was garrisoned solely to give an additional garrison on this line. The native repairmen refused at this time to work, and their places had to be filled by American linemen. There was nothing accomplished in this month except the putting up of another wire between Palo and Tacloban in order to avoid relaying.

In December the Cebu-Ormoc cable was grounded on the night of the 8th, during a violent typhoon, and was probably caused by the American gunboat *Isla de Cuba* dragging her anchor across it. As there was no outside connection with this cable gone, there was no attempt made to reconstruct the line across the island, which had again been torn down. The constructing squad, however, was kept busy by the repairs which were necessary owing to the large number of cuts during this period. On the 1st of January there were 11 stations open, but communication between them was uncertain. The wire cutting ceased, however, shortly after; with the exception of the country between Palo and Alang-Alang there was little trouble. In January little could be done, as all troops were kept extremely busy.

On the 3d of February, however, the Ormoc cable was repaired, and on March 2 all the lines in Leyte were connected, and Tacloban for the first time had regular connection with its own stations and the outside world.

During March and April the district signal officer was badly handicapped on account of the fact that six of the men in his squad applied for examination for second lieutenantcies in the line, and three or four of the six were absent most of those two months. He, however, started on the construction of the west coast line, from Ormoc south, which is to extend to Maasin, Hilongas, Sogod, and Matalom. On April 29 he had reached Baybay.

DEPARTMENT OF MINDANAO AND JOLO.

Prior to the arrival of the cable ship *Burnside* at Misamis, Mindanao, in January, 1901, few attempts had been made to establish telegraphic communication in that department. Indeed, owing to the mountainous character of the country, number of rivers, and infrequency of coast roads, it is difficult, if not impracticable, to connect the greater part of the posts by land lines.

The signal officer of the department, quoting Lieut. W. Twyman, Thirty-first Infantry, United States Volunteers, says:

"Per verbal orders commanding officer second district, Mindanao and Jolo, construction of the telegraph line from Tucuran to Lintogo to connect the Misamis cable was begun on December 19, 1900, and completed January 17, 1901. The line was built on poles over the open and on trees through thick woods traversed by the trail. Thirty coils of No. 9 G. I. wire were used. The first part of the trail is very crooked and runs through two bamboo brakes, each 14 miles in length. The line was built through the first brake, which could not be avoided, but around the second one. This did not shorten the distance, but the line is sheltered by woods and is at no place more than 1 mile from the trail. Washouts are not probable, owing to the altitude of the trail, but during the north coast monsoon season just passed trouble was experienced by falling limbs and trees and heavy swaying of trees. From Lubig to Lintogo the trail is more direct and on comparatively level ground, making construction and maintenance much easier than the Tucuran end.

"I personally superintended the construction of the above work. The Lintogo end can be and is now being repaired, so that wagons and sledges may readily transport supplies. A new trail has been surveyed from Tucuran to Lubig and is now being constructed. It is more direct than the old trail and avoids the winding hills. It can be cleared to admit of wagon transportation. Natives have shown no disposition to molest the lines."

And adds:

"On account of trouble experienced during the northeast monsoons I found it necessary to establish a repair station at Lubig or Lintogo. This station was established at Lintogo February 24. With two Signal Corps men and a detachment from Tucuran I personally superintended the reconstruction of this line, adding slack where it was considered necessary, and putting up a number of swinging insulators. No trouble was experienced until an exceedingly heavy monsoon passed over, and almost the entire line between Tucuran and Lubig was torn from the trees. This was repaired as soon as possible. The testing station was then moved to Lubig, as it was considered to be nearer the trouble. This has proven correct, as breaks are now of very short duration.

"On account of the short time allotted me in compiling this report it is impracticable to forward a full report of construction and operation of all systems."

On arrival of the cable ship at Tucuran communication was immediately established with Manila, cable was then laid from Tucuran to Zamboanga, and from Zamboanga to Jolo. The ship then returned to Dumaguete to connect Dumaguete with Oslob on the island of Cebu.

In the meantime the construction of a telegraph line from Oslob to Cebu with iron poles and new wire had been provided for, thus giving Dumaguete two outlets for messages for Mindanao, one by way of Bacolod to Iloilo and the other by way of Cebu to Iloilo. A land line has also been built from Misamis to Jimenez and Oroquieta, and will later on be extended to Dapitan. Short extensions have also been made from Zamboanga and Cottabato. The completion of this extension has placed the department commander of Mindanao and Jolo in communication with all his important posts and with division headquarters. The extensive use already made of it by both military and civil governments is evidence of its importance and usefulness, the business handled here in messages sent and received during the month of April amounting to over 5,000.

Sufficient cable is now on hand to connect Tucuran with Malabang, and from there to the important posts of Cottabato.

Under direction of the division commander request has been made for sufficient cable to extend the lines in this department to Siasi and Bongao in the Tawi-Tawi group. This cable when laid will complete the contemplated extensions in the department of Mindanao and Jolo. Later on it will be desirable if possible to connect the important district of Surigao either with Bohol or Leyte, as circumstances may determine.

There is sufficient cable on hand and in transit to connect Albay with Bacon and Saragon with Palanog, Masbate (the construction of a land line from Palanog across the island to the south coast and down the eastern coast to Catangan has been pro-

vided for), Palanog with Calbayog and Catbalogan, Samar, and Catbalogan with some point to be determined in the island of Leyte. These extensions of about 250 knots will complete a military system from Aparri and Bangui on the extreme north end of the island of Luzon to the extreme south point of the same island, thence to the islands of Masbate, Samar, Leyte, Cebu, Negros, Mindanao, and Jolo. Sufficient cable is also being manufactured which will soon be shipped to connect the islands of Mindoro, Marinduque, Bohol, and Basilan.

With a view of having a complete cable line from Oslob to Jolo, it is contemplated to lay from Lintogo to Tucuran an underground lead-covered cable, the overhead line being liable to interruption by falling trees in the forests through which this line necessarily passes.

There is a demand for an extension of the cable system to connect points which it is now impracticable to reach with land lines. A small yearly extension of the system already established and the maintenance and rearrangement of existing lines will provide the Philippine Islands with a system of communication by telegraph and telephone that will not only facilitate the transaction of business by the civil and military governments, but will also be capable of producing a very considerable revenue.

There is at present in the Philippine Islands 4,710 miles of land line, and 750 miles of cable, connecting 600 telegraph and telephone offices in 400 different towns. There is on hand and in transit, and shortly to be shipped 605 miles of cable. This cable will be laid immediately upon its arrival, making the total mileage of cable in the Philippine Islands 1,355 miles, and if the request for 200 miles needed for the connection of Siasi and Bongao is approved there will be a total mileage of 1,555 miles of cable.

The United States on their part have furnished a most ample supply of material, and up to July 1, 1900, paid the expenses of maintaining military lines. Beginning with the present fiscal year the United States Philippine Commission has supplemented the means furnished by the United States by such appropriations as have been necessary from time to time to carry on the work.

While there has been at all times a very generous supply of money and material, we have never had at any time the number of men that were really needed to properly conduct the system. The maximum number of men present and available for duty was on April 1, 1901, 29 officers and 505 men. Since that date 15 officers have been relieved and 20 enlisted men ordered discharged from the various companies, leaving for duty at present 14 officers and 483 men, and there still remains on file applications from 60 men for different positions in the Philippine Islands, a number of whom will no doubt, from time to time, obtain positions and be discharged.

JUNE 30, 1900.

The line from Guinayangan to Atimonan has been built at least four times, but have been unable to keep up communication between Guinayangan and Manila on account of cutting of line. Have asked for a garrison to be placed at Lopez with a view of protecting the wire.

The lines on the entire island of Luzon have been reconstructed from one end to the other, and are maintained except where cut by insurgents. The last typhoon did considerable damage, but it has all been practically repaired. The railroad about Tarlac is for 2 miles entirely under water, with very little prospect of repairing it during the rainy season. The poles are standing along the route, but in a very precarious condition, and am going to send 2 miles of cable to lay along the railroad. It is an extraordinary country where we lay deep-sea cable in the middle of an island. The Aparri line has worked very well, except, as should be expected, we have interruptions of a few hours or a day at a time. Every effort is being made to keep it up, and both General MacArthur and General Wheaton are deeply interested in its maintenance.

JULY 14, 1900.

It is very gratifying to report that the entire system has been established on the islands of Luzon, Panay, Negros, Cebu, and Leyte. While the cable connects the island of Samar, it has been impossible to carry the land line to Catbalogan, as there has not been enough troops to enable us to proceed with the construction. Additional men have been sent to that point, and we hope very soon to have connection with Catbalogan. It is hoped by the end of the year we will have Jolo, Zamboanga, and the other points on Mindanao connected.

Lieutenant Stamford and 10 men, as you know, left for China with the Ninth Infantry, and an order has just been received for Major Scriven to go. Lieutenant Stamford was very well supplied with field instruments, and also equipped for permanent lines. We gave him 10 of our very best men, and it is next to impossible to

spare any more to send from here. I hope to send a detachment of linemen with Major Scriven when he goes. Have been waiting to hear from Lieutenant Stamford to know what the probable requirements would be.

Notwithstanding the rainy season we are so far working with slight interruption. Lieutenant Mitchell is at Solano on the Aparri line, and I have no doubt that he will keep that line going, as he is most energetic and efficient. Lieutenant Kenesly's work on the Atimonan-Guinayangan line was extremely good. He has had no end of trouble, and as a matter of fact has rebuilt the line two or three times, as it was cut in many places by the insurgents. Two captains of Colonel Gardiner's regiment (whose names I will give you later) have helped him out immensely and enabled him to complete the work.

August 1, 1900.

A great many of the officers and men have been personally commended to me by the line officers and post commanders, and I have asked them in each case to make it a matter of record in their reports. I think the hard work and gallant bravery of a great many of the corps have received almost universal commendation.

General MacArthur has given us a most earnest and liberal support, to which fact, added to the broad and generous policy adopted by yourself, is due the large amount of work accomplished during the year. It certainly has extended beyond what anybody expected it would do.

The completion of the Aparri line, owing to the difficulties encountered, was an extremely fine piece of work, and reaching the Camarines was one of the best things that we have been able to accomplish. Lieutenant Lyman has done a tremendous amount of work in the Camarines and Lieutenant Kennedy's work in getting the line through from Guinayangan to Atimonan was extremely praiseworthy. Lieutenant Wheat is now in that district doing excellent work. The history of the Signal Corps is written in the reports of the chief signal officer of the departments, and if they can not be published in full, I hope that as liberal extracts will be made from them as possible.

You will see by the table inclosed with my report that based on the casualties of last year 9 men per month will be required to keep the force up to its present number. The chances are that there will be many more casualties this year than last, and as we are working the men to the absolute limit, there ought not to be less than 15 men per month sent to these islands.

There has been a tremendous amount of line cutting during the month of July, and there seems to be an organized attack upon the lines. We lost 3 men in three successive days. There have been a number of cases where repairmen and small squads have been attacked, but have escaped. In some cases they have succeeded in killing or capturing the men who were actually cutting the wires.

When the southern cables are completed we will have most complete means of communication. The work of extension is still going on to reach the few remaining posts that are not connected with the system.

Captain Carr just came and says that one-half mile line between Cabaratan and San Jose was cut out last night, and 300 insurgents are intrenched near Santo Domingo; 5 Americans killed; General Funston is after them this morning, and we may expect some result.

August 4, 1900.

There has been added during the month extensions from San Manuel to San Nicholas and Pozorrubio to Alava, which if not too late can be entered on the map for this year. The line shown from San Fernando to La Trinidad on the last map sent you is correct, and not as previously shown from Aringay to Trinidad.

Other extensions are under way, but not completed at the end of the month. There has been a great amount of line cutting during the month. The Signal Corps repairmen have been engaged in several fights.

Sergeants Cockayne and Billman have been killed and Private McElhager is missing. He was probably killed, but his body was never recovered.

Lieutenant Mitchell has been doing some excellent work on the Aparri line, and it has been working very well. The feature of the month has been the unprecedented destruction of lines and the excellent work done by linemen in repairing same.

The business handled on Luzon alone was 208,000 messages, report not having been received yet from the Visayas, which runs from 10,000 to 12,000 per month, making the approximate amount about 220,000 messages for the month, representing something like two and one-half to three million words. This does not take into account telephone messages on the different systems. There has been a very large amount of business transacted exclusively by telephone.

There are a great many men sick, and we hope that men will be sent out when possible. No men have been received since the 11th of June, and we should have ten or fifteen per month in order to keep up at all.

Lieutenant Stamford is calling for men in China, and it is utterly impossible to send them without closing offices here. I am in great hope that you sent some on the *Grant*. Will be very glad if the 7 men you telegraphed about some time ago were on the *Grant* and got off there.

AUGUST 15, 1900.

At the commencement of July there were in operation 3,000 miles of telegraph lines and cable, with 350 men available for duty in the Philippines. No additions to the force arrived during the month and but 3 men were transferred from the line, while reports show a decrease in strength as follows: One lineman missing, 2 linemen killed, 3 men sent to the United States for medical treatment in addition, to 1 discharged to accept commission.

During the month, on the island of Luzon, 208,083 messages were sent and received by telegraph—about 23 per man per day, and in addition a large business was transacted exclusively by telephone.

The most notable feature of the month was the increased amount of line cutting, which, added to the ordinary repairs required and the large amount of business handled, kept the force fully employed. Memoranda attached give the principal interruptions to lines in Luzon in July.

The reports of line interruptions include the following:

From southern Luzon: "On the 3d of July the first wire cutting began near Candelaria on the Tayabas line. From then on scarcely a day passed that the lines were not cut either here, south of Santa Cruz, or between Lucena and Atimonan. A report from the lineman at Majayjay lately received shows that in the last two weeks of July not a day passed without a line being cut and more or less destroyed on both sides of that place."

Northern Luzon was similarly affected and reported as follows: "The insurgents have been very active during the month in the province of Ilocos Sur, repeatedly cutting the wire, removing poles and wire, causing considerable hard work on the part of the corps, but very slight interruption of communication has been experienced. On July 26 the insurgents cut the line 1 mile south of Orani on the Angeles-Orion line, pulling the poles out of the ground, breaking the insulators, and carrying away 700 feet of wire. The line was promptly repaired. On July 28, 500 feet of wire on the San Fernando-Lubao branch about one-half mile east of Guagua was destroyed, but promptly repaired.

"The San Fernando-Aparri section was frequently cut during the month a short distance north of Cabanatuan. Between the 20th and 31st this line was cut four times, poles cut down, and wire carried away. The severe storms have done a great amount of damage on this line. On July 16 the line was down in five places near Cabiao, caused by falling trees. Considering the difficulties on this section, communications between Manila and Aparri have been well handled, the longest interruption not exceeding twelve hours."

Reports from the Visayan Islands are as follows:

Panay: "On the eastern side of the island the communication between Barotac and Banate has been abandoned, but material has been forwarded, and it is hoped it can be rebuilt and maintained. On the west coast San Jose is separated from San Joaquin by a break of some 20 miles. The remaining line is cut at least once and sometimes twice a day in same locality."

On Leyte much of the wire built has been torn down. Lieutenant Wallace reports: "I built 9 miles of wire east of Ormoc, and a detachment came through yesterday and reported it all gone. The colonel thinks he can keep up the lines on the east coast better, as the posts are closer together; so he has directed me to let the main line go a while and build down Dulag way. This is, I think, a good idea."

Encounters with the insurgents resulted seriously in several instances. In southern Luzon, Captain Russel reports as follows: "On July 18 the line went down between Cabuyao and Calamba. Sergt. Albert H. Cockayne, Company E, Signal Corps, lineman at Calamba, set out in his usual energetic fashion to repair the same. Unfortunately the delay in furnishing him escort caused him to go out with only one assistant detailed from the infantry. At the barrio about midway, where the break was, they were fired upon and the helper's horse killed, but he escaped in the thicket after having seen Sergeant Cockayne fall in the road as if badly wounded. His riderless pony ran back toward Calamba, thus giving the alarm at Calamba, and a mounted party was sent out, finding the helper, but not Sergeant Cockayne. Another energetic lineman, Sergeant Mueller, had been approaching from the north, was fired upon, but got through to Calamba. He returned and succeeded in finding the body of Sergeant Cockayne pierced with several bullet wounds. The remains were brought to Manila and buried July 20."

In northern Luzon, Captain Carr reports: "While en route with signal supplies

from Vigan for the Badoc-Currimao line, escorted by 17 men of Company C, Twelfth Infantry, Sergt. Warren Billman, Company F, Signal Corps, was killed in ambush by the insurgents July 21; all supplies were captured. Also Private William B. McElhager, Company F, repairman at San Isidro, while on the road to Capan on repair work, was reported captured by insurgents July 14."

The large amount of repairs necessary during the month reduced the quantity of new construction and rebuilding on a permanent basis.

Captain Russel reports for southern Luzon: "Lieutenant Kennedy and party having completed communication between Guinayangan and Lucena, via Lopez and Atimonan, the first message came through from Nueva Caceres on July 10. An office was opened at Lopez on July 14, this being necessary as a repair and testing point.

"The line between Taguig and Muntinlupa, consisting of No. 14 wire, became so rusted as to be impossible to keep up. Lieutenant Kennedy, with party of 4 men and 6 natives, constructed a strong pole line between these points with No. 9 wire; 10 of the 12 miles were completed by the end of the month.

"On the 1st of July Lieutenant Wheat reached Sariaya and took charge of pushing the line through from that point to Tayabas, a distance of about 8 miles. The hasty field line was replaced by a strong pole line, making good telegraphic connection between Tayabas and Calamba. He energetically reorganized affairs there, both as to reconstruction of lines and installation of offices. A good chief operator, Sergeant Lacy, was sent to take charge of Tayabas office. Since that time the service with Tayabas has been very satisfactory."

Reports from the Camarines show a rather discouraging state of affairs regarding extensions of lines in Albay Province. It is believed much time will elapse before it will be practicable to build and maintain lines north of Legaspi.

Captain Carr reports for northern Luzon: "Lieutenant Duffy and detachment completed the San Fernando-La Trinidad branch July 11. Lieutenant Lenoir's party connected Pozorrubio telegraphically with Alava, 6 miles, and San Manuel with San Nicholas, 8 miles; also changed 3 miles of line on the Bantista-Cabanatuan branch east of Rosales, from through the woods to along the road. This section has practically been rebuilt during July from Bantista to San Jose, distance 80 miles. His party moved offices at the following stations: Talarac, Bamban, Moncada, Paniqui, and Gerona, from railway to commanding officers' quarters. Total new work, 38½ miles."

First Lieutenant Wildman reports for the Visayan Islands:

Panay: "The country has been reconnoitered with the object of establishing communication between North and South Panay by way of Ajui and Banate. This line will be entirely impracticable unless more troops are stationed in that vicinity. As it stands now, Capiz is in communication with Sara, Ajui, Dumarao, Dao, Mambusao, but connection with the south half is entirely interrupted by reason of the inability of the troops to protect the line between Pototan and Dumarao."

On Cebu, 34 miles of line have been put in, ending at Sambuan, which is the Cebu heliograph station for Dumaguete. Lieutenant Davies is now back in Cebu preparing to build a line from Sambuan to Alegria, 15 miles, and from Dumanjuc to Balamban, 45 miles on the west coast.

On the island of Negros, Lieutenant Clifton is building a line from Dumaguete to Amblan, which is nearly finished. On Bohol the line has been extended to Jagna, and on Leyte from Palo to Tanauan and Dagami.

During the month several new offices were opened, memorandum of same being attached. An office being desired at Zapote Bridge, a modified "Ryselberghe" system of two telephones, one at telegraph office Los Pinas, the other at Zapote Bridge, was superposed on the telegraph line. The system has given complete satisfaction.

Reports rendered give the following not previously included:

Corpl. Charles E. Russell and Sergt. Philip J. Golden are especially mentioned in the Visayan Department for creditable work, while the chief signal officer, Department of Southern Luzon, in addition to specially commending First-Class Private Howe as being out repairing several times under circumstances of the greatest danger, includes the following in his report:

"On July 18 Corporal James, lineman at Santa Cruz, went out with a detachment repairing near Maglalena. He had with him a field telephone. The detachment was attacked by a much larger force of insurgents in ambush. The sound of the firing brought troops from the south. At this time Corporal James attached his field telephone and got word to the commanding officer at Santa Cruz, he in turn telephoning to Pagsanjan. This brought out a cavalry detachment promptly, who fell upon the retreating insurgents from the east. The insurgents were so surprised they fell an easy prey, and were almost annihilated. This is sighted as a very pretty practical application of the telegraph in war, even of the guerrilla variety."

August 25, 1900.

We have had a tremendous amount of line cutting. This interference with lines continued during the month of August, and in addition to other difficulties we have had an extremely severe typhoon. During the entire typhoon communication was kept up with Aparri, and a great part of the time with the Camarines. Now, however, that a great amount of the rain that fell during the typhoon has gotten into the rivers, it has rendered many of them impassable, and it is impossible for repair men to get at the line. The railroad is washed out, and has been for some weeks, between Manila and Dagupan. While many places are cut off from Manila, the local systems are working very well, and all the absolutely essential communications are maintained.

The amount of work being performed by the men is telling very rapidly upon the health of the command. We are losing men continually by death and the sick report is growing. We got a few men from the line and General MacArthur transfers without hesitation any man who applies. This source of supply, however, is a very meager one and will soon be exhausted. I can offer no suggestion as to how men may be procured, but it is essential we have them from some source.

The 2 officers and 7 men on the *Grant* were, as you will have been informed before you receive this, diverted to China, and all the supplies that could be taken off were also taken by Major Scriven. Until the *Grant* is unloaded it will be impossible to say what went there and what came here.

The 30 men that you informed me were on the *Sherman* will help us out immensely. The only possible suggestion I can make is to repeat the one I have already mentioned two or three times—to work the school at Fort Myer to its full capacity. The demand for operators from now on I have no doubt will be even greater than it is now, so that every encouragement should be given the young men to go to Fort Myer, and keep them there, if necessary, an entire year.

OCTOBER 1, 1900.

I received on the *Morven* 50 miles of cable, 40 miles of which has already been laid in the Laguna, a very important matter coming up making it absolutely necessary to have uninterrupted communication with Siniloan.

The cable was coiled on a large lorch and towed by the gunboat *Florida*. It left Calamba yesterday morning at 8.30, and at 2 o'clock the cable had been completed to Santa Cruz. They left Santa Cruz this morning at 8.30 and completed connection with Siniloan at 2.30 this afternoon. Both lines were successfully laid at the rate of 3½ miles an hour. It was extremely good work. Captain Russel was in charge, and I was in communication with him by cable during the entire time of laying.

OCTOBER 13, 1900.

Since the first of the month there has not been as much line cutting as during September, but day before yesterday a repair guard of 20 men was attacked, and so far only 7 of them have returned.

The lines have been working very well, and we have been doing an immense amount of work on them, putting in new poles and constantly repairing.

The amount of work per month is increasing. The number of messages during August per man per day was 20.5, which is over double what it was in August, 1899. In September the rate has gone up to 21.7. We will probably have to take up commercial business sooner or later, but it is absolutely impossible with the present number of operators and facilities as to lines. The lines are working about their full capacity as it is now.

I can only recommend that as fast as men can be procured that they be forwarded. The number of offices will, of course, gradually increase.

OCTOBER 22, 1900.

The lines are all working very well except a little stretch between Guinayangan and Atimonan, with which we have considerable trouble in repairing on account of extremely high water. I have quite a strong party there, who are putting in new poles and expect to have it soon in first-class condition.

You will see by the returns that there are quite a number of men transferred from the line, but most of these cases do not add anything to the force, as they are nearly all of them on detached service. As I wrote you before, we need a regular supply monthly of from 10 to 15 men to keep up the present offices and for extensions.

There were sent and received during September over 240,000 messages, representing 7,200,000 words sent and received, or 3,600,000 words sent, which, at the Government rate of 1 cent per word, would amount to \$36,000 for the month, which is, approximately, just about what the entire system costs. The above does not include the exclusive telephone business.

We are anxiously awaiting the arrival of the *Burnside*, and will proceed to get in the cable upon her arrival.

HEADQUARTERS DIVISION OF THE PHILIPPINES,
OFFICE OF CHIEF SIGNAL OFFICER,
Manila, P. I., August 7, 1901.

Telegraph, telephone, and cable miles operated (including reconstruction).

Month.	Miles.		Number of men.	Messages sent and received.		New construction.
	Number.	Number per man.		Number.	Per man per day.	
July.....	3,007	8.2	366	230,000	19.4	Miles. 134
August.....	3,111	8.8	356	235,000	21.3	79
September.....	3,220	8.9	362	241,364	22.2	81
October.....	3,301	8.6	382	312,169	26.4	53
November.....	3,354	8.0	401	305,000	25.4	80
December.....	3,434	8.7	426	295,009	22.4	140
January.....	3,574	7.7	464	310,000	21.5	207
February.....	3,781	8.0	469	298,312	22.4	625
March.....	4,406	8.7	505	313,498	20.0	487
April.....	4,893	10.0	489	308,755	21.1	584
May.....	5,477	11.4	480	277,180	*18.6	34
June.....	5,511	11.4	481	276,025	19.2	89
July 1.....	5,600					

¹ Including signalmen on *Burnside*.

² Estimated.

HEADQUARTERS DIVISION OF THE PHILIPPINES,
OFFICE OF CHIEF SIGNAL OFFICER,
Manila, P. I., August 7, 1901.

Miles of permanent construction.

	Land.	Cable.	Total.
Constructed July 1, 1900.....	2,797	210	3,007
1900.			
July.....	134		134
August.....	79		79
September.....	70	11	81
October.....	50	3	53
November.....	80		80
December.....	35	105	140
1901.	448	119	567
January.....	105	102	207
February.....	330	295	625
March.....	464	23	487
April.....	584		584
May.....	34		34
June.....	89		89
Total.....	1,606	420	2,026
Total year.....	2,054	539	2,593
Constructed July 1, 1901.....	4,851	749	5,600

Signal Corps, U. S. Army, division of the Philippines, Manila, P. I.

	1900.						1901.						Total.
	July.	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	
Number of men present first of month.....	390	388	396	406	428	451	487	492	517	512	510	513	.....
Arrived by transport.....			26	18	24	33	6	21	2	5	20	33	188
Transferred from line.....	3	12	7	9	6	12	5	7				1	62
Reenlisted.....				1	1		1	2				2	7
Total.....	393	400	431	434	459	496	499	522	519	517	530	549	257
Transferred to line.										1			1
Discharged:													
Orders, No. 3, Chief Signal Officer, Army series 1901.....										1	12	4	17
General Orders No. 141, series 1900, D. of P.....							1		1			3	5
Expiration of service.....					2	3		2	3	3	1	3	17
Disability.....	2											1	3
G. C. M.....			3			1			1	1	1	1	8
To accept commission.....	1		1			1					1	2	6
Killed and missing.....	2				1	2			1				7
Died of disease.....		2	1	1				1			2		7
Deserted.....									1				1
Transferred to Company G, Signal Corps, in United States.....			7	5	5	2	6	2				3	30
Transferred to Company I, Signal Corps, in China.....			12							1			13
Total.....	5	2	25	6	8	9	7	5	7	7	17	17	115

APPENDIX No. 9.

EXTRACTS FROM REPORTS OF CAPT. GEORGE O. SQUIER, SIGNAL CORPS, ON CABLE OPERATIONS IN THE PHILIPPINES, ALSO UPON THE GROWTH OF GUTTA-PERCHA IN THAT ARCHIPELAGO, WITH EXTRACTS FROM REPORT OF CAPT. EDGAR RUSSEL RELATIVE TO DAILY OPERATIONS ON THE CABLE SHIP BURNSIDE.

OFF PORT SAID, October 26, 1900.

As far as the Signal Corps operations are concerned everything is in good condition, as last reported.

On the night of the 24th instant, while at sea, important and essential valves of the engine broke down, causing us to lay to for five hours, until it could be temporarily repaired on board. In consequence of repairs from this cause I have just been informed by the transport quartermaster that we will probably be obliged to lay at Port Said until some time next Tuesday, and will then proceed through the canal and direct to Aden.

As you know, it is extremely dangerous to the health of the ship to pump into the tanks foul and dirty water, such as is frequently found at the anchorages assigned for coaling purposes. Repeatedly doing this causes a foul sediment in the tanks, which when drying out decomposes, and besides injuring the cable by rotting it, it has frequently in the past been the cause of an epidemic on board before the cable could be removed and laid.

To reduce the above effects to a minimum, we have arranged a method of taking water into the tanks over the side of the ship and near the surface, instead of at the muddy bottom.

Flooding cable tanks at sea even in the calmest of weather has often been attempted in the past and found impracticable.

We thus are able to properly flood the tanks and conduct the cable tests while the ship is being held for other purposes, so that no delay to the ship will be caused by the Signal Corps operations on board.

CABLE SHIP *BURNSIDE*, IN STRAIT OF BAB EL MANDER, ARABIA,
November 5, 1900.

I have to report that we shall arrive off Aden at midnight to-night and shall immediately flood the cable tanks, and shall sail to-morrow at noon, if possible, for Colombo.

As soon as leaving Aden we shall begin to prepare the bow of the ship to receive the cable-laying machinery in Manila.

The bulwark plate on either side of the stem piece above the topgallant forecastle deck has to be removed and the stem piece cut to a height of 10 inches above the topgallant forecastle deck. After this 12 by 12 timbers are to be fitted athwart ships on the forecastle, beginning from the stem and carrying it aft to within 6 inches of the upright of the anchor crane. Although we have but one ship's carpenter, when we should have had also a carpenter's mate, we shall try, with the aid of the crew and the Signal Corps men, to have this work done upon arrival at Manila, so that we can start almost immediately to lay the cable. In fact, we are utilizing the time of passage in making everything ready for the cable work.

The *Burnside* is proving herself a staunch ship, but she is very slow and can make but about 10 knots per hour despite the best efforts of the engineering department. This, however, is no drawback as far as cable operations are concerned.

SULU ARCHIPELAGO, TAWI-TAWI GROUP, ISLAND OF BONGAO, P. I.,
Cable ship *Burnside*, March 6, 1901.

Bongao is the southernmost garrison occupied by United States troops in these islands, and is just off the coast of North Borneo.

On February 28, at 4.15 p. m., we successfully finished laying our last main cable, brought over on the *Burnside*, after a little over two months of the most difficult work any of us have ever experienced. All of the cables have been laid, however, without a hitch, and are now in successful operation. The last cable laid was from Zamboanga, Mindanao, to the island of Jolo (Sulu), which connected with for the first time our friend His Majesty the Sultan of Jolo and the garrison on the island direct to the city of Washington by a copper wire every inch of the distance.

On our way back at Zamboanga the *Burnside* received cable orders to proceed south to the Tawi-Tawi group to attempt to save the wreck of the Government steam launch, the *Maud*, which had gone on the rocks at Bongao some ten days before. Accordingly we sailed the same evening, taking the eastern passage around the Sulu Archipelago. This was on the evening of March 1, and we reached Bongao Point at about 3 p. m. Sunday, March 3, remaining there until March 6. The *Maud* was found to be high and dry on a sharp point of rocks just off the coast, with small holes punched in her bottom. During the next two days, by working night and day, she was pulled off the rocks by the *Burnside*, her bottom patched, and placed in good running condition, thus saving, I believe, some \$15,000 to the Government.

The Government of the Tawi-Tawi group comprises about 20 islands and an estimated population of about 20,000, entirely Moros. It also includes the Cibitu Islands, about 18 or 20 miles from the coast of Borneo, which were omitted from the Paris treaty and recently purchased by our Government.

The inhabitants of this group (Tawi-Tawi) are the Bojan. They are all either pirates, ex-pirates, or descendants of pirates, but now rarely exercise their craft, and then only on each other. All of the natives are armed with a weapon called the "barong," which is a knife, often with a beautifully carved handle of wood, silver, or ivory, and a blade beautifully balanced and capable of striking down a slave or opponent with a single blow. These knives are the principal property of the natives, and they spend most of their energy working upon them.

Our cable work here, extended over the last two months, has taken us pretty thoroughly over the whole extent of the Philippines from Manila to Borneo. Beginning with the great island of Mindanao, second only to Luzon in size, and extending south, including the Jolo, Siasi, and Tawi-Tawi groups, is a great natural division of the Philippines which differs entirely in the character of the inhabitants, religion, customs, and trade. The northern and southern islands are like two different countries. The southern division is Mahomedan and its inhabitants are Moros. I believe that few of our people in the United States appreciate the extent and magnificent possibilities of our new island possessions in the East. I myself had no conception of them before. They include an area nearly as large as the Empire of Japan and about twice the size of the British Islands, with a population of about 8,000,000 people, extending in latitude from about 4° to 21° N. I was surprised to find that the southern islands have very little connection with the northern ones, and practically all the trade from the south is conducted with Borneo and Singapore. There is a regular line of monthly steamers between Jolo and Singapore, and practically no business is carried on between Jolo and Manila.



MOUNTING CABLE MACHINERY ON U. S. CABLE SHIP BURNSIDE, MANILA BAY, DECEMBER 15, 1900.





TRENCHING SHORE END OF CABLE, DUMAGUETE, P. I., DECEMBER 26, 1900.

The joining up of these islands with the northern islands by a line of cables during the last two months I believe will have an incalculable value in the development of the Philippines from every standpoint. Already the north and south are getting acquainted with each other, and daily cablegrams pass between Jolo and Manila. It is believed that the laying of these cables will mark an epoch. The system should be extended until it includes all of the principal islands and garrisons in these possessions.

The natural resources of this country seem almost unlimited. The climate, particularly of the south, is delightful. Hemp, rice, tobacco, coffee, corn, cocoanut palms, and in fact almost any product will grow with a minimum effort. Such lumber forests I have never seen before. The most beautiful hard woods abound in great variety, and there is enough lumber in the southern islands of the Philippines to supply us for years to come.

OFF NEGROS, EN ROUTE TO PASCAO, P. I.,
March 28, 1901.

As you already know from Colonel Allen's cablegrams, practically all of the cable which was brought over on the *Burnside* has been laid and is now in successful operation. We have now been out on this expedition over three months from Manila, and it has been a three months of most strenuous effort for all of us. There has been no stopping for holidays, Sundays, day or night, with the single exception of the 22d of February, when at Zamboanga, having completed the night before the Tukuran-Zamboanga cable, we dressed ship, fired a national salute, and entertained on board Colonel Pettit and his staff and Rajah Muda Mandi, the heir apparent to the Sultanate of Jolo.

Our cable experience on this expedition has been novel indeed. We have had to not only install everything on shore for the shipment of a cable office, but due to the incompleteness and inaccuracies of the navigating charts of this region we have had to do much of our own surveying and sounding. All of the cable has been laid with the greatest care, and barring natural accidents should last indefinitely, with the exception of the 50 miles of Brixey cable sent over, which was laid by itself in the Cagayan-Yligan section.

The rubber core of the Safety cable has turned out very well indeed, and seems well suited to the Signal Corps work here. The outer serving of the Safety cable, however, is much inferior to that of the Brixey. The outer serving and finish of the Brixey cable is the finest I have ever seen, and we should demand this standard for all Safety cable purchased in the future. All of us have had a grand opportunity, under the difficulties we have had to encounter, to gain practical experience, and I believe it no exaggeration to say that the *Burnside*, as now organized, can perform any cable work suited to her size as quickly and as efficiently as any cable ship in the world. This is a strong statement, but I believe it to be true. Each of the different departments of the ship now know their work so thoroughly that the cable operations run along smoothly and steadily. Our 30 native Filipino crew who work in the cable tanks are most dextrous and efficient. They were all selected specially for this work; and for this climate are superior to white men.

After completing the cable to Jolo we were suddenly ordered from Manila by telegraph to proceed south to the Tawi-Tawi group and endeavor to rescue the Government's steam launch *Maud*. With all our blocks, tackles, ropes, etc., and trained crew, we were well suited for the work and saved the boat in a couple of days.

The military governor of Bongao, in the Tawi-Tawi group, has submitted an official application for an extension of the cable from Jolo to Siasi and Bongao, thereby furnishing a complete trunk line of cable to the most southern garrison in the Philippines. After seeing the extent, fertility, and possibility of this group, it is clear that there will be a permanent garrison at Bongao, and this extension of the cable should be made in the near future.

It is believed that the laying of these cables will mark an epoch in the development of our new island empire. Heretofore there has been very little communication of any sort between the northern islands and the southern islands, beginning with the great island of Mindanao. Now for the first time there is a real connection between the two great divisions of the Philippines, so entirely different in their inhabitants, conditions, laws, and forms of government.

Moroland and the rest of the Philippines are like two different countries. Under Spanish rule they were not acquainted with each other to any extent. I was surprised to find that the natural market for the Sulu Archipelago is Singapore and Sandakin, the capital of North Borneo, and not Manila. All of the trade and commerce of these southern islands drifts to these ports instead of being retained for a Philippine capital. There is a regular monthly line of steamers plying between Jolo and Singapore. At Bongao and our recent purchase, the Sibitu Islands, even the

Philippine money of the north is not circulated to any extent, and the currency used is Chinese silver and the coins of North Borneo and the Straits Settlements. Nothing will aid more toward binding together this entire chain of the Philippines, consisting of about 1,200 islands and covering an area nearly twice as large as the British Islands, nearly the size of the Empire of Japan, and extending from 4° to 21° north latitude, than the trunk line of telegraphic communications which should ultimately extend from Bongao on the south to Appari, on north coast of Luzon. Already this trunk line is completed with the exception of the Jolo-Bongao section.

Already official time is furnished at 11 o'clock each day by cable to the principal points in the Department of Mindanao and Jolo, as far south as Jolo, and it is hoped that within a very short time the principal Australian steamers to and from Manila, which pass through the narrow channel between Basilan and Mindanao, will be reported to the captain of the port at Manila by telegraph, with a consequent aid to the commerce of this congested port. It is also expected that meteorological observations will be sent daily from the cable stations of the southern islands, and that typhoon warning signals will be displayed at Jolo and Zamboanga from Manila.

I understand that more cable is being shipped out from time to time on commercial steamers, to be unloaded here, reloaded again on the cable ship, to be laid. From my experience thus far I strongly advise against this method of shipping cable half way around the world. It is a method only justified in cases of great emergency which have existed in the past, but which now, since the main lines are down, no longer exist. If there is one lesson that we have learned on this expedition, it is that you can not hurry cable operations. Success can only be obtained from the closest and most careful work and continuous observation from the time the cable is made in the factory until it is in the bottom of the sea. Every time we have tried to hurry anything for every day saved we have lost three. When it is remembered that cable property is supposed to last at least fifty years, and that its life depends largely upon its being manufactured, transported, and laid in the proper scientific manner, it seems poor economy to endeavor to gain perhaps a couple of months of that fifty years in the beginning by shipping cable as freight on a commercial steamer dry, and with absolutely no supervision of it by anyone competent to take care of cable property. We are proceeding now to Pascao, to take out a cable which was laid last year about 12 miles, which, on account of lying dry for several months and spliced in many pieces, has now to be abandoned entirely. Of course this could not be avoided, as it came over on the cable ship *Hooker*, which was wrecked, but in my opinion the only way to successfully carry out cable work is in accordance with the best experience and practice available. Every day's additional experience out here adds evidence to that view.

REPORT OF HENRY WINTER, CABLE ENGINEER, SIGNAL CORPS.

OCTOBER 7, 1901.

I have the honor to make the following report of work done under my superintendence during the erecting or installation and altering of cable tanks; also in the storage of Safety and Kerite cable in tanks on *Burnside*.

On August 14 I was engaged as cable engineer to the expedition, and proceeded on board *Burnside* to superintend the setting up of the cable tanks in ship's hold.

At that date they were no further advanced than the half of No. 2 cable tank, placed on built platform in the main hold.

On August 15 the representatives of the Safety Cable Company were instructed to begin coiling cable on a barge, to be ready for shipment when required.

The constructor of cable tanks (Mr. Collins) announced on the 23d of August that No. 2 cable tank was ready for testing. Thereupon I tested the tank, but found it leaked very badly, particularly at the junction of cone and bottom plates. Mr. Collins was told to make the tank water-tight as quickly as possible. The riveters, however, refused to work overtime for him on the night of August 24, and as the cable was ordered to be alongside the ship at daylight the next morning, and was then already on its way up to the ship, the superintendent of the Morse Iron Works was requested to make the tank water-tight. This was done by 3 o'clock the next morning. Shortly afterwards the cable came alongside on a barge, and men from the Safety Cable Company commenced coiling cable into No. 2 tank.

On the evening of August 30 No. 1 cable tank was tested and found water-tight. More cable was ordered from the Safety Company to be alongside the ship the next



morning. This cable came early on the 31st, and was coiled in No. 1 tank September 5. On the first barge which came from the Safety Company I observed a quantity of cable which bore marks of having been subjected to very rough usage. I notified the manager of the company, and requested him to send a representative to view the cable; he did so, and upon inquiry I learned that the cable had fouled on a reel one night while they were putting it on a barge. I directed that the damaged length—and the representative of the company agreed to this—be cut out, which, when done, I measured the piece and found it to be 8,000 feet.

The first consignment of cable was coiled into the No. 2 tank, and measured by tank capacity was 198.5 miles. At noon 50 miles more cable arrived, the end of which was joined to 198.5. Coiling in tank No. 2 was then resumed.

After trying in every conceivable way to get No. 3 cable tank into the space allotted for it, and not being able to do so, it was decided to let a pocket into the fore side of the lower plate in the tank. Mr. Collins having stated his inability to do this, the order was given to the Morse Iron Works. This tank was completed and ready for cable on September 8, on which date commenced taking 25 miles of Kerite aboard into No. 3 tank. On the evening of this day was finished the shipment of Safety cables (50 miles), 25 miles of it having been coiled in No. 1 tank and 25 in tank No. 2.

The 25 miles of Kerite cable were aboard in the afternoon of September 10, 40 miles more of Kerite arriving September 12, and was all into tank No. 3 by September 14, when 70 miles more of Safety came, the shipment of which was finished September 19, and 35 miles of Safety were ready to be joined up to 70-mile length and be coiled into No. 3 tank, which was finished September 21.

The last consignment of deep-sea cable (45 miles) arrived on September 22, and was all on board by the night of the 23d; the shore-end cable (9 miles) was then ready on the barge. As, however, the ship was to make a trial trip on the 24th, the shipment of the shore end was deferred until the night of the 24th, and it was completed by 7 a. m., September 25, all cable being then on board.

The conditions were very unfavorable during the taking aboard of the cable. Over two hundred mechanics were on board, working with sharp tools, riveting and drilling in the vicinity of the cable tanks, the latter frequently occupying my entire attention to see that they dropped no oil on the cable. It was altogether useless cautioning them; in fact, no one on or about the ship seemed to realize the extreme susceptibility of the cable to damage.

The place where the ship was lying—the pier of the Morse Iron Works—is in my opinion quite an unsuitable position at which to take in cable. Not a day passed without the cable barge having to be shifted four or five times from alongside the ship to allow other barges or vessels to pass into the dock. This operation being one extremely likely to damage the cable in unskilled hands, and devolving a loss of four or five fours, frequently more, each day, and as the Government paid the men employed to stow the cable, it will be seen the loss of time involved quite a serious amount. In my opinion it is preferable, where conditions permit, to take the ship to the cable-factory wharf, or as near as possible. I see no reason why the crew of the ship should not coil the cable into the tanks. I have always used them to do so hitherto with advantage. It is really what they are on the ship for, and they work as speedily as possible to finish an unpleasant task, while the casual laborer wishes to make his employment last as long as possible. At every opportunity, whenever I could get at the end of a length of cable, I examined the mechanical construction of the cable and found tape and jute coverings very good. Have gauged armor wires with Brown & Sharpe gauge and found deep-sea type to be No. 12. The lay, however, frequently extends over 11 inches, while the specification calls for 10, and has a tendency to elongate toward the end, and it was only near the end where I could make observations. The outside service of the last 35 miles supplied by the Safety Company does not have the same adhesive quality which the former 450 miles possessed, which may be due to the fact that the makers were very much hurried while making it, and it was handled three times before the compound had sufficient time to cool and harden.

The outside armor wires of the shore end are No. 6 Brown & Sharpe. To the present time I have had no opportunity for testing their strength, but shall do so at the earliest and submit report to you.

The Kerite is a very good cable; it has certainly impressed everyone very favorably who has knowledge of the matter. It differs from the Safety in the direction which the armor wires are laid, the Kerite wires being laid from right to left on its upper radius, while the Safety wires are laid from left to right on its upper radius. This would be a vital point if qualities were ordered from these two companies to form one long cable, more especially if it were to be laid in deep water. As the splice

between the two would clear the ship, the torsion, taking exactly opposite directions, would cause each cable to separate itself from the other.

I would like to call your attention to No. 3 cable tank, which is placed hard against the underneath of the between decks, which renders 24 feet of the whole diameter of the tank useless for cable, that height being about the least in which a man can work for the purposes of stowing and, more particularly, paying out the cable. This is important, inasmuch as the other cable tanks are both placed before the middle of the ship; consequently there is an inclination for her to trim by the head, which is not desirable, the reverse being the usual method.

No. 2 cable tank may with advantage have an additional plate to the height of 3 feet 2 inches added to it, this tank being the one nearest the center of the ship, therefore the part in which the greatest weight should be placed. If this addition be made, 65 miles more of the deep-sea type we have on board may easily be carried. The rivets inside the tanks should be flush with the bottom and sides, also in the cone where the cable lays against it. The bottom of tank should not be cut away from under cone; to do so materially weakens the tank.

EXTRACT FROM REPORT OF CAPT. GEORGE O. SQUIER, SIGNAL CORPS, UPON THE GROWTH OF GUTTA-PERCHA IN THE PHILIPPINE ARCHIPELAGO.

ZAMBOANGA, MINDANAO, P. I., March 19, 1901.

Opportunity has been thus far presented for only such inquiries and personal observation upon the growth of gutta-percha in the Philippine Archipelago as could be obtained during the cable-laying expedition to the southern islands on the U. S. cableship *Burnside* during the past three months. In each of the points visited in the islands of Mindanao, Jolo, and the Tawi-Tawi group every opportunity has been utilized for collecting samples of gutta-percha or interviewing the different commanding officers of troops and presidents of towns, the leading Chinese merchants, and the native gatherers themselves regarding the production, location, quantity, quality, price, etc., of the gutta-percha product of these islands.

The great importance of gutta-percha at this time is in connection with the large amount of submarine cables projected by the United States and other countries for the near future. Never before has there been such an era of submarine-cable extension all over the world.

Gutta-percha is at present considered the only suitable material for the insulation of deep-sea ocean cables. The use of rubber for insulation is steadily advancing, but at present none of the leading submarine-cable manufacturers would care to take the responsibility of constructing an ocean cable 2,000 miles in length of rubber insulation. The importance of this product to the United States can be appreciated by stating that an advance of but 50 cents per pound in the price of gutta-percha would increase the original cost of the materials for the proposed American trans-Pacific cable by over a million dollars.

While at Singapore, November 26 to 29, 1900, en route to Manila on the cable ship *Burnside*, opportunity was presented for procuring some information upon this subject at the principal gutta-percha market of the world.

The botanical gardens were visited and the different kinds of gutta-percha trees examined, while samples of the leaves, twigs, and bark were secured to assist in rough identification later in the Philippines.

Through the kindness of his excellency Sir Francis A. Swettenham, governor of the Straits Settlements, Mr. J. M. Campbell, acting United States vice and deputy consul-general, and the director of the botanical gardens, Singapore, I was enabled to obtain the following data relative to gutta-percha at Singapore.

GUTTA-PERCHA.

This name is given to the inspissated juice which is produced chiefly by *dichopsis gutta*. It must not, however, be confused with caoutchouc, a somewhat similar product produced by plants belonging to the natural orders Apocynaceae, Moraceae, Euphorbiaceae, etc., while gutta-percha is produced by plants belonging to the natural order Sapotaceae only. *Dichopsis gutta* is the chief tree that produces gutta-percha, and is known to the natives as "Getah taban merah." It is a tree of large size, from 4 to 5 feet in diameter, and a height of between 100 and 200 feet; when growing in the forest it has a clean straight stem, and it may be generally distinguished



LAUNCH OF U. S. CABLE SHIP BURNSIDE TOWING NATIVE BANCA. CABLE LAYING UP LINTOGUP RIVER, MINDANAO, P. I.,
JANUARY 1, 1901.



by the rich brown color of the undersurface of the leaves. Flowers small, white, and divided into 6 petals and 6 sepals. The seeds, generally two in each fruit, are oily, and are eaten by birds and monkeys. It flowers in March and the fruit ripens in June.

According to Wray, the method of collecting the gutta is as follows: A tree having been selected is felled, and as it lies on the ground V-shaped rings about 1 inch broad are cut in the bark at intervals all along the whole length of the trunk, and of the large branches, with a parang. These cuts soon become filled with the white cream-like sap, and in about half an hour the gutta will have separated from the aqueous portion of the sap, and may then be removed by rolling a small ball of it around in the cuts, to the edge of which the coagulated gum adheres and forms a disk, varying in size according to the number of scores it is rolled in.

These disks are then boiled in water and made into balls and sold by the collectors to the men who export it to Penang or Singapore. The gutta is at first white, but soon changes to pink and finally to a brownish red. The water in which the gum is boiled becomes a dark red brown, and this coloration is the most distinctive feature that this variety possesses, and by which it may be easily recognized.

The amount yielded by a single tree, about 100 feet high, and whose age was estimated to be over a hundred years, was 2 pounds 5 ounces of fairly clean gutta, valued by a Malay dealer at 10s. per pound.

While *Dichopsis gutta* is the tree that produces getah taban merah, there are other trees which produce gutta-percha of a more or less inferior quality to *D. gutta*. The following are the chief:

Getah taba putih (white), *Dichopsis polyantha?* Getah taba sutra (silk), *Dichopsis* sp. Getah taban chayur (liquid), *Dichopsis* sp. Getah taban simpur, *D. mainagapi?*

Getah Sundik is produced by a different genus than the foregoing, viz, by *Pagania leeri*. Several other gutta-producing genera are known to exist, such as *Bassia dyeri*, etc., but as the gutta is of inferior quality it is used only in adulterating the better kinds.

Dr. Burck, of the botanic gardens, Java, in a work on the botanical origin of gutta-percha, enumerates no less than 7 genera, containing 92 species, all producing gutta in more or less quantity, in many of which, however, the gutta is in such small quantities as to hardly pay for collecting.

Quantity and value of gutta-percha, and the places from whence imported into Singapore during 1859:

	Piculs.		Piculs.
Chinese ports	23 $\frac{10}{100}$	Pahang	753 $\frac{1}{2}$
Bali	33	Patani	1
British North Borneo	967 $\frac{10}{100}$	Penang	3, 675
Brunei	8 $\frac{3}{100}$	Rhio	33
Celebes	4	Sarawak	5, 132 $\frac{1}{2}$
Dutch Borneo	14, 159	Selangor	209
France	10	Sulu Archipelago	31
Java	1, 383 $\frac{1}{2}$	Sumatra	36, 097 $\frac{50}{100}$
Johor	159 $\frac{1}{2}$	Sumhei Ujong	46
Kelantan	189 $\frac{50}{100}$	Tringranu	591 $\frac{10}{100}$
Labuan	680	United Kingdom	82
Malacca	140 $\frac{10}{100}$	United States Atlantic	1 $\frac{15}{100}$
Natunas Islands	6		
Netherlands Archipelago	172 $\frac{1}{2}$	Total	64, 588 $\frac{21}{100}$

Equaling 8,611,888 pounds, valued at \$7,845,652.

PRICES OF GUTTA-PERCHA CURRENT AT SINGAPORE NOVEMBER, 1900.

First quality	per picul ..	\$400-600
Medium quality	do	300-450
Lower quality	do	50-200

GUTTA-PERCHA IN THE PHILIPPINES.

Gutta-percha is found in the Philippine Archipelago in the southern islands only, none occurring north of the island of Mindanao.

At Cagayan January 19 to 21, 1901, the temporary headquarters of the department commander, opportunity was presented for conferring with General Kobbe as to the probable value of this product in the department of Mindanao and Jolo. Some of the samples forwarded herewith were furnished later by the department commander,

and I am indebted also to him for information contained herein. Gutta-percha is hardly known at present as Philippine export, except by the very few foreign dealers, who have apparently guarded their secret well. Its value is not generally appreciated, and there has been no systematic attempt to gather it or estimate its extent. It is found, however, that valuable quantities are being gathered at present by the natives, sold locally to Chinese merchants, and quietly shipped to Singapore, where enormous profits are apparently being realized. Even by the desultory and wasteful manner in which it is being collected by the natives, it is learned that in the region surrounding Cottabato alone, in southern Mindanao, \$300,000 worth of gutta-percha has been shipped, principally to Singapore, during the past year. At Zamboanga and at Tukuran, Mindanao, the purchasing price from the natives ranges from \$30 to \$60 Mexican currency per picul (133½ pounds avoirdupois), while, as seen above, the current price in Singapore is from \$50 to \$600 per picul.

From the best evidence obtainable, it appears that gutta-percha is plentiful along the southern coast of the great island of Mindanao. Capt. W. J. White, Thirty-first United States Volunteer Infantry, commanding officer at Tukuran, reports extensive forests of gutta-percha trees near Lintogup and along the land telegraph line recently constructed across the narrow isthmus from Lintogup to Tukuran. At Zamboanga it is reported that extensive forests of these trees are to be found in the province of Zamboanga and Cottabato.

At Bongao I was informed by the local Chinese merchant and by the native Moros that large quantities were to be found on the island of Tawi-Tawi, in the Tawi-Tawi group, but of course there was no means of verifying this.

The Chinese merchant at Bongao buys small quantities of gutta-percha, brought in by natives from neighboring islands on market days. As there is no means of regular shipping from this point to Sandakan, North Borneo, or Singapore, he has made no attempt to encourage the gathering of the product, nor does he appear to appreciate in any way its value and uses.

From its geographical position, it would seem that gutta-percha would be found extensively both in the Tawi-Tawi and Siasi groups, as well as in the Jolo group.

The classification and value of gutta-percha for electrical insulation purposes can only be determined by careful chemical analyses, preferably by those who have had long experience in its use and in the manufacture of submarine cables. For this reason it is manifestly impossible to express in this report reliable opinion as to the quality of the gutta-percha which is found in these islands.

The natives, in gathering this forest product, instead of extracting from incisions in the standing tree in the proper manner, ruthlessly destroy the trees by felling them, to facilitate their work. To prevent a repetition of the experience which England had in the Straits Settlements prior to 1857, when hundreds of thousands of valuable percha trees, including whole forests on the island of Singapore, were destroyed, the military government of the Philippines should institute effective means for preventing the felling of trees and for supervising the gathering of this product.

In the excellent work of the forestry division of the Philippines provisions have been already made for this in chapters 5 and 6 of General Orders, No. 92, office of the military governor in the Philippine Islands, Manila, P. I., June 27, 1900. The fear will be in the lack of means for carrying these laws into effect throughout the extensive and remote forest regions which only the native Moros and Pagan tribes at present frequent.

It would seem that the cooperation of the native dattos and their followings would be the most promising means, investing them with a local authority in the matter and giving regular remuneration for services rendered to the Government as forest rangers.

A gutta-percha tree requires from fifteen to twenty years to reach a maturity producing the best gutta product, and I was informed by the director of the botanical gardens at Singapore that the gutta-percha tree was perhaps the most difficult one to experimentally cultivate and with which we had to deal. Raising the gutta-percha plant from the seed is particularly difficult, while the offering of extensive prices at Singapore to the natives who will bring in young plants fails to secure the number desired by the Government for cultivation purposes. The qualities of gutta-percha which have been required in the past and which will be necessary for the new submarine cables in the near future, have justly alarmed the great cable manufacturers in England and has led to recent very stringent rules being instituted in the Malay States and dependencies by the British Government itself. There seems to be danger that the world's supply of this material will become exhausted and the steady and tremendous advance in the price of this material within the last two years is perhaps the best indication of the growing difficulty in meeting demands.

In the classical Cantor lectures on gutta-percha by Dr. Eugene F. A. Obach, before the Society for the Encouragement of Arts, Manufactures, and Commerce, it is stated that the region from which all genuine gutta-percha is derived extends from 6° on either side of the Equator, and from 99° to 119° east longitude, or embraces but 12° of latitude and 20° of longitude, and that it occurs nowhere else on the globe.

Although this region does not include the Sulu Archipelago, yet the latter is just east of this boundary and within the same limits of latitude, and naturally we would expect it to be found here.

Since the discovery of gutta-percha in 1847, several technical committees have been appointed by scientific bodies and by the Government to investigate the subject, but so far as can be learned from the literature available here, none of the expeditions sent in search of the gutta-percha trees have specially examined and reported upon the Sulu Archipelago. In fact, wildness of the regions and the great dread of the Moro pirates in these islands under the Spanish rule would have made thorough scientific search difficult. No less than four Government expeditions in search of gutta-percha trees have been sent to the Malay Archipelago by the English and French, the last one in 1887.

RECOMMENDATIONS.

In conclusion, it may be said that there is no doubt but that there are large quantities of so-called gutta-percha in the southern islands of the Philippine Archipelago, and that the extent and value of this product can only be determined by careful prospecting and examination by recognized gutta-percha experts.

The market at present for the Sulu Archipelago is Singapore, and not Manila. There is every evidence that the buyers in Singapore, due to the scarcity and recent great profits to be made in gutta-percha, are looking for the purchase of whatever product can be obtained from the Philippines, and I have evidence of a single shipping of gutta-percha from Cottabato to Singapore which netted the Singapore dealer \$30,000. As stated above, the Singapore dealers who are posted as to the value of this product naturally are interested that no knowledge of the subject shall be obtained, and in fact none of the natives, nor indeed any of the inhabitants, appreciate the present value of gutta-percha as a commercial product in the world's market.

Due to the large demand for this material, processes have been developed for extracting the gutta-percha from the dry leaves, bark, and twigs of the trees by an entirely mechanical method, thus preserving the trees themselves, which can yield indefinitely. It is claimed for this process, which is now in operation in Singapore, that whereas only about one sixty-fourth part of the gutta is obtained by the natives, the leaves and twigs are found to contain 9 to 10 per cent of clean gutta, and that as high as 3 per cent has been extracted from the bark stripped off of trees which have been left laying on the ground by the natives for three or four years as useless.

It is recommended that immediate steps be taken to prevent the destroying of the gutta-percha trees by the natives in gathering the product, and that samples of the so-called gutta-percha, some of which are forwarded with this report, be subjected to careful chemical analysis by a recognized authority upon the subject, and that if such report warrants, that a special expedition, under the general supervision of the forestry division of the Philippines, be sent out at an early date to determine the location, extent, quality, quantity, etc., of this product with a view to securing for the Government what may prove a most valuable and lasting industry in these islands.

Assuming a construction equal to that employed in the latest Atlantic cables, the proposed American trans-Pacific cable alone will require about 3,000,000 pounds of gutta-percha in the near future.

EXTRACTS FROM REPORT OF CAPT. EDGAR RUSSEL, SIGNAL CORPS, ON OPERATIONS U. S. CABLE SHIP *BURNSIDE* IN THE PHILIPPINES.

PRELIMINARY NOTE.

The U. S. army transport *Burnside* (cable ship) was formerly the *Rita*, a Spanish merchant ship plying between the West Indies and Spanish ports, until April, 1898, when, a few days after the declaration of war between the United States and Spain, she was taken as a prize by the *Yale* while on the way to Habana with a cargo. She was put into the transport service between New York, Porto Rico, and Cuba until July, 1900, when she was overhauled and refitted for cable laying at the Morse Iron Works, Brooklyn. She has a net tonnage of 1,408. The cargo, consisting of cable in the three tanks, 423.6 knots deep sea and 7.8 knots shore end Safety

Insulated Wire and Cable Company (rubber) cable, and 56.6 Brixey Company Kerite cable, with signal and quartermaster's supplies, was loaded by September 26, 1900, and the ship sailed for Manila. She arrived in Manila Bay December 6, 1900, and from then until December 23 was fitted with cable machinery taken from the former cable ship *Hooker* and put in good repair at the Signal Corps shops, Manila.

When she sailed on December 23, the following was the personnel on board: Lieut. Col. James Allen, Signal Corps, chief signal officer, Division of the Philippines, in charge of cable operations; Capt. Edgar Russel, signal officer, United States Volunteers; Capt. George O. Squier, signal officer, United States Volunteers; First Lieut. F. M. Jones, signal officer, United States Volunteers; Second Lieut. H. S. Hathaway, signal officer, United States Volunteers; Second Lieut. Earle W. Binkley, signal officer, United States Volunteers.

The following enlisted men of Company E, Signal Corps: First-class Sergt. Clifford DeKast, joiner; First-class Sergt. F. W. Bohler, in charge cable machinery; First-class Sergt. Thomas P. Akers, first sergeant-operator; Sergeant M. J. Quirk, clerk; Corpl. A. H. Hunter, operator and lineman; Corpl. J. R. Mossman, stenographer; Corpl. M. W. Newberry, photographer; First-class Private C. S. Dauler, electrician; First-class Privates Ira L. Davis, J. G. Fagg, A. G. Luckett, P. B. Long, and J. Sheridan, operators; First-class Private E. E. Sickafus, operator and lineman; First-class Private J. H. Spillane, lineman; Second-class Private J. E. W. Asselin, operator; Second-class Private E. M. McKinney, operator and lineman; Second-class Privates A. M. Taylor and M. H. Garrison, operators.

A crew of native laborers, 36 in number, with 1 interpreter.

Maj. J. C. W. Brooks, quartermaster, United States Volunteers, was quartermaster in charge of ship, with the following ship's officers: Captain, A. H. Laffin; chief engineer, Charles Stewart; first officer, L. C. Caddell; second officer, J. Kellerhouse; third officer, C. R. Croucher; fourth officer, A. D. Dorey.

A crew of men, 69 in number, and a complement of 2 clerks, and 27 cooks, waiters, messmen, etc., were on board.

First Lieutenant Harnett, assistant surgeon, United States Army, and 2 Hospital Corps men.

Mr. Henry Winter, cable engineer.

Mr. F. A. Hamilton, cable electrician.

Cable seaman, Charles Koch, and 2 extra carpenters.

Captain Russel's duties were commanding detachment and superintendence of the installation and of necessary offices and land lines; Captain Squier was in charge of the testing and electrical researches generally; Lieutenant Jones, property and disbursing officer; Lieutenant Hathaway, office installations; Lieutenant Binkley, land lines.

The enlisted men's special duties as named. Officers and men, however, were called upon to participate in all classes of the work both aboard and on shore.

Operators were left off at the various cable stations, as noted in the subsequent report.

DAILY JOURNAL UNITED STATES CABLE SHIP BURNSIDE, DECEMBER 23, 1900, TO APRIL 6, 1901.

[Extracts.]

Sunday, December 23, 1900.—Sailed at 8.15 a. m. from anchorage in Manila, going out Boca Chica Channel; clear weather; at noon longitude 120° 22' E., latitude 14° 15' N.

December 24.—Sailing along west coast of Panay; clear, with strong breeze. Noon longitude 121° 38' E., latitude 10° 40' N.

December 25.—Arrived off Dumaguete, Negros, 7.45 a. m. In afternoon picked out landing for cable near mouth of creek, where mud and fresh water prevented coral growth. Landing about 600 yards south of office.

December 26.—Lieutenant Binkley and party went ashore with cable hut, digging tools, and material for construction of iron-pole land line from the office to cable hut. Lieutenant Hathaway took the office equipment, consisting of 1 double current set, 90 cells Gonda Battery, set of pine shelves, small switch board, and lightning arresters.

Good room in headquarters building designated for office. The office was subsequently wired with lead-covered wire. Private Taylor was installed as assistant operator. Lieutenant Binkley employed 36 natives, at 50 cents Mexican per day, to dig the trench to the cable hut and assist in putting up the hut. Mr. Winter and all available men then got out 1 mile of shore end in two ship's boats and paid out from the ship to the shore. The ship was anchored about one-half mile from



TAKING DEEP-SEA SOUNDINGS WITH SIGSBEE SOUNDING MACHINE, U. S. CABLE SHIP BURNSIDE, FEBRUARY 18, 1901.

the landing. The strong current made landing very difficult, which caused several accidents, but cable was landed and put in trench, a spare length of about a quarter of a mile being doubled back and lashed to the "dead man." This second piece was destined for the cable leading northward. The ship paid out and buoyed the remainder of the mile of cable. During the paying out it was fouled by the anchor chains and considerably abraded. The office, land line, cable hut, and trenches were completed by night.

December 27.—Ship started at daylight to pick up the buoy, the abraded portions being taken up and cut off. Another mile of shore end was spliced on and paid out. This all completed by early afternoon, and buoy placed at end. Took up our course for Oroquita Mindanao. Soundings were taken that p. m.

During the night ship laid to in vicinity of the last sounding.

December 28.—Continued on the course, taking soundings every half hour. Started taking the shore end out of tanks and piling them in the hold.

Heavy surf prevented our landing at Oroquita, where we anchored at 2.30 p. m.

December 29.—Sailed at 6 a. m. for Misamis, taking soundings. Coast of Mindanao about 5 miles distant. Finished turning over shore end from tank to hold.

Anchored off Misamis, 10.30 a. m., about 2 miles north. Went ashore in the afternoon. Selected a place in the old fort for the cable hut, and located the office in the office of the captain of the port. In the evening went to Lokulon, hired a large banca on which to load cable for laying up the bay.

December 30.—Lieutenant Binkley, assisted by natives from the ship and native prisoners from the shore, put up the cable hut and dug a trench about 100 yards to landing place of cable. Lieutenant Hathaway and party put in the office equipment, consisting of one double-current polarized relay set for Dumaguete, and two single-current sets for Yligan and Lintogup, respectively. All lines supplied from the 90 cells of battery used for the double-current set. The usual equipment of shelves, switch board, and tables was put in. On the ship, during the day, 35 miles of cable were turned over from the middle to the forward tank.

December 31.—Captain Squier took charge of a party to lay cable up the bay, accompanied by Lieutenant Binkley, Mr. Winter, and Mr. Hamilton, 3 Signal Corps men, and 10 natives. Fifteen men of the Forty-first Infantry, under Captain McGirr, went as an escort, two launches, towing 2 ship's boats and a sailing banca, upon which 9 miles of cable from the main tank had been loaded the previous day. That afternoon Cable Seaman Koch took a small sailing banca loaded with 5 miles of cable from the main tank, assisted by 3 natives and 1 signalman, and sailed up the bay to join the other party.

January 1, 1901.—No work on ship. Reports from party up the bay; much difficulty due to wind and adverse tides.

January 2.—Telegraph practice instituted. All the men instructed in use of the double-current and open-circuit system. Reported that first 9 miles of cable had been laid up the bay.

January 3.—Large banca returned and 8.9 knots more cable from the main tank loaded on. Trench from office south about 300 yards completed for the Lintogup cable.

January 4.—Finished loading large banca and sent it down the bay.

January 5.—No cable laid in bay on account of high winds. Night being calm, cable was laid and landed at the trench during the night.

January 6.—Went ashore with Lieutenant Hathaway, and 40 native prisoners; cleared out trench and brought cable up to office; then covered over the cable. Mr. Hamilton's preliminary test showed cable grounded, probably near the far end.

Large banca with 2.9 miles cable remaining brought alongside the ship. Test showed bad fault in cable. It was taken off by hand and 6 miles of good cable from the main tank put on the banca. The work took all night.

January 7.—Banca, towed by both tugs, proceeded to the end of the trench leading to the cable hut and landed the end of the cable. Cable paid out very nicely and the 6 miles northward were run out and end buoyed by 10.30 a. m. Banca brought alongside about noon, the pine platform taken off from her and she was returned to the owners. Ninety dollars Mexican was paid for the nine days' use. In the afternoon began turning over the cable from after to main tank. Two kinks occurred at lead over after tank, which had to be cut out and splices made. Neither kink injured the core, but badly damaged the armor wire. The work continued all night.

January 8.—Continued turning over cable all day. Observations taken for correction of chart from Bukagon Hill and Misamis. The cable was cut and tested at forty-fifth mile, the fault still remaining in after tank. Privates Luckett and Fagg detailed as operators at Misamis.

January 9.—Turning over cable until 1.30 p. m., when 63 knots had been put into

main tank. Cut and tested and found fault $2\frac{1}{2}$ miles from the top of main tank. Fault subsequently found to be due to rupture of armor wires and puncture of core (piece preserved). Weighed anchor in the afternoon and proceeded to the buoy, 6 miles northward, and got Misamis 5.45 p. m.

January 10.—Proceeded to buoy end and raised at 6.40 a. m. Sounding at buoy 78 fathoms; soft mud bottom. Got Misamis 6.42 a. m. Splice made and overboard at 8 a. m.

Started paying out at 8.05 a. m. forward tank. Cable available as follows: Forward tank, 30 knots; main tank, 59 knots; after tank, 30 knots; making $4\frac{1}{2}$ knots at 8.30, $6\frac{1}{2}$ knots an hour at 11.30, $5\frac{1}{2}$ knots an hour at 12.20 p. m.

Distance on chart, $35\frac{1}{2}$ knots; distance on drum, 38 knots, corresponding to 12,180 revolutions.

Foul flake at 4.05 p. m., mass of tangled cable coming up to the drum and blocking it. Full speed astern instantly given; dynamometer went up 4,000 pounds, and the cable broke, end going overboard.

Fouling cable in tank was caused by a turn next to the cone dropping below in the next flake.

Sounding was made at the break, showing 260 fathoms. Buoy over at 4.45 p. m.

Grapnel rigged and sounding 1 mile southwest of buoy, 206 fathoms. Began grappling at 6; cable hooked at 7.30 p. m. Bight on board at 8.30; spoke Misamis. Splice completed and bight overboard at 11.40 p. m.

January 11.—Continued laying toward Dumaguete.

At 8.55 a. m. trouble occurred in tank, but kinks were gotten out before any damage was done. Arrived at Dumaguete buoy 1.35 p. m. Drum 17,045. Picked up buoy at 2.16 p. m. Communication with Misamis 2.15 p. m. Warned them to be ready to open communication from their office with Dumaguete office. Sent party ashore to connect our office. Party reported no communication with Misamis up to 6 p. m.

January 12.—Unable to raise Misamis after trying all forenoon. Dumaguete office and land line O. K. In the afternoon put a wire ashore from the ship to the hut, and by capacity test found disconnection at Misamis. Sailed for Misamis midnight.

January 13.—Sighted mark buoy at 6.20 a. m.; picked it up at 8 a. m. Arrived at Misamis at 1.15 p. m.; cut out lightning arrester at hut. Removed arrester; cut line straight through. Commercial business at once. Got a schooner from Warner, Barnes & Co. and rigged it for deck load with pine timbers. Put 5 miles of cable aboard in the afternoon.

January 14.—Schooner towed by two launches. Laid shore end of Yligan cable 5 miles and started paying out at 6.30 at the beach. Returned 9.15 a. m. Sailed for Yligan 10 a. m., taking soundings, arriving in front of Yligan at 2.30 p. m.

January 15.—Started paying out shore end daylight, using three ship's boats in tandem, with about 600 feet of cable in each. A line was run ashore, which was used for hauling in boats by hand. First shore end in by 10 o'clock, and trench finished by soldiers of the garrison (Captain Stevens's company, Twenty-third infantry). The shore end was spliced to lead-covered cable, about 150 feet long, going to switchboard. Office set up in building near the wharf by Lieutenant Hathaway and party; single current, ordinary relay set. Thirty cells of "Gonda" battery were set up, only 20 of which were found necessary. Usual equipment of shelves, switchboard, and tables was put in. Private Davis detailed as operator.

In the afternoon the Cagayan shore end was put in direct to switchboard. The trench was covered and office completed by evening. Both shore ends were carried out and buoyed.

January 16.—Proceeded to location of Cagayan buoy; found it sunk. Commenced grappling for shore end; hooked it about 9.50; brought and cut bight about 10.30, from 125 fathoms. Buoyed at 11.25. Then proceeded to pick up remaining sea end, 59 turns of drum, when buoy came aboard, badly crushed, apparently being smashed by propeller.

In the afternoon turned over 1,924 turns of cable from main to after tank.

January 17.—Picked up buoy, Misamis shore end, 6.45 a. m.; spliced it to top end of after tank. Started paying out 8.48 a. m. At 11 a. m. weather became so thick that it was impossible to get good bearings. Splice went over 1,926 on drum.

Course, S. 84° W. No further bearings could be obtained before 2.50 p. m., when Misamis shore-end buoy was sighted dead ahead.

Anchored 3.15 p. m. Picked up buoy and completed splice 5.15 p. m. Anchored near buoy for the night.

January 18.—Weighed anchor at 6 a. m. Went into Misamis Harbor. Connected up at office and hut and began working with Yligan at 8.45 a. m. Dumaguete and Misamis found to work satisfactorily with 20 cells on front and 10 on back stroke. Ten cells found to be enough for line to Yligan.



LANDING SHORE END IN SHIP'S BOATS, U. S. CABLE SHIP BURNSIDE, ILIGAN, MINDANAO, P. I., JANUARY 15, 1901.





UNITED STATES SIGNAL CORPS TELEGRAPH AND CABLE OFFICE, LIGAN, MINDANAO, P. I., JANUARY 16, 1901.

Turned over cable from after to main tank in afternoon, 3,610 on drum (11.14 knots) turned over by night.

Experiments on splicing kerite made, showed that curing in hot paraffin made kerite brittle. Concluded to make an uncured joint and serve it with Chatterton's compound.

Sailed from Misamis at 1 p. m. Arrived at Yligan 4.30 p. m., and sent natives ashore to take small schooner back to Misamis. Laid off Yligan during night.

January 19.—Took careful measure of drum. Found it would give 1 knot (6,080 feet.) in 324 revolutions. Sailed for Cagayan. Taking soundings; 2 p. m. anchored one-third mile from Cagayan wharf. Went ashore and decided to land cable at village near mouth of river and carry line on iron poles up the road to Cagayan, about 2½ miles.

During the day on the ship engaged in turning over kerite cable from after to main tank.

January 20.—Lieutenant Binkley and party took material for 2½ miles No. 9 line and construction of cable hut ashore. Trench dug by soldiers detailed from Fortieth Infantry. Hut put up about 500 yards north of wharf. Lieutenant Hathaway and party put the office in post headquarters building. Single-current, open-circuit, set with ordinary relay, the usual equipment of shelves, tables, and switchboard; 30 "Gonda" cells set up.

January 21.—Much trouble locating faults in kerite. Deck covered with pieces cut off in searching for faults. Land lines completed and office installed.

January 22.—Turning over kerite cable. Faults located and turning over completed. About 4 knots of faulty cable left out of tank.

Privates Asselin and Garrison detailed as operators at Cagayan.

January 23.—Sailed for Yligan 1.30 p. m. Placed buoy at 2.55 p. m.

Second buoy placed about 10 miles north. No bearings. Lights placed on both buoys for marks on our return with cable. Laid off Yligan during night.

January 24.—Raised buoy and opened communication with Yligan at 7.30 a. m. Splice completed and started paying out kerite from main tank at 8.25 a. m.

At 8.45 cable started slipping on drum, and prompt action required to prevent its "taking charge." Another turn put around drum. Paying out at 8.52.

Cut and buoyed end off Cagayan at 6.23 p. m.

January 25.—Picked up buoy; spliced to shore end, using launch and small boat. Communication opened with Misamis at 8.55 a. m. from Cagayan office.

Sailed for Cebu about 1 p. m., taking up mark buoys en route.

January 26.—Reached Cebu about 7.45 a. m. Anchored about one-fourth mile from old wharf and began coaling.

January 27.—Inspected cable landing up beach at Maholo (about 2 miles north of Cebu). Found it in very bad shape and connected to bad land line.

January 28.—Secured small boat for bringing shore end into Cebu. Arranged for installing open-circuit set and Gonda batteries in Cebu office. Engaged for native prisoners and laborers to dig trench to office from a point on the beach about 150 yards west of Eastern Extension office (length, about 700 yards). Began turning over cable from main to after tank.

January 29.—By use of launch, hired boat, and ship's boat, end of cable was taken from beach, spliced to 1½ miles of shore end, and brought down to new landing at Cebu. Office at Cebu completely rewired. Still turning over cable.

January 30.—Trench completed and 675 yards lead-covered cable laid and covered. Lead cable carried up the pole at office in 2-inch iron pipe securely wired to pole, making a neat and safe job. Continued turning over cable. Coaling.

January 31.—Turning over cable. Forty-three knots turned over from main tank to after tank by night. Coaling.

February 1.—Turning over cable. Still coaling. Dissected a kerite joint made in the factory or ship at New York. Found that the rubber splicing material did not adhere to the kerite core, but could be easily pulled off. No fusion of the surfaces existed—a very unsafe joint. Twenty-nine knots of cable turned over during the day. Coaling.

February 2.—Coaling and turning over cable. Cut at eighty-first knot and began searching for fault; not supposed to be in upper flakes of main tank. Fault located about 8 knots down. Test of another kerite joint showed no adhesion without Chatterton's compound.

February 3.—Sailed 6 a. m. for Liloan, arriving 8 a. m. Went ashore with Lieutenant Hathaway and party—Messrs. Davies, Winter, and Hamilton. Received word from Cebu that Yligan-Cagayan cable was broken. Took up temporary splice made by Lieutenant Davies on shore end, near high water, and made a good splice.

Put in an open-circuit key, shelves, etc., 10 cells wet and 11 dry battery cells. Tested with Weston instruments and found Cebu end all right. Rough coral beach

and cable exposed, but the intermediate type cable apparently all right. Sailed for Ormoc at 1 p. m., where we arrived at 7 p. m. and anchored.

February 4.—Put in open-circuit key, set of shelves and 20 cells Gonda battery in Ormoc office. Break in cable found about a half mile out. Test from ship to Liloan all right, but no communication from shore. Party in small boat underran cable toward beach. While they were doing so a 200-volt Weston voltmeter was put in series with cable and 20 cells of battery. While underrunning a marked change in the reading occurred at a certain place, which was found to be at a factory splice. When this was cut the conductor was found to be parted at the splice. This was repaired and communication opened with Cebu at 3 p. m. Sailed for Cebu at 11 p. m., after placing a mark buoy about half a mile out from cable landing.

February 5.—Arrived at Cebu 7 a. m. and unloaded 600 iron poles for the Argao line. Began turning over cable from forward to main tank. Sailed for Misamis about 1.30 p. m.

February 6.—Arrived at Misamis 7.30 a. m. Organized two parties to go up the bay to Lintogup. Started at 9.30 a. m. Winter and party on *Grace* and small boat. Captain Russel and Lieutenant Binkley, with small boat towed by *Burnside* launch, followed soon after. Major Brooks accompanied us.

Reached the mouth of Lintogup River at 12.30, and Winter started underrunning cable to the north. Our party went up the river $2\frac{1}{2}$ miles to cable hut; found it all right and land line completed. Test with Weston instruments located break in cable $3\frac{1}{2}$ miles out. Connected up cable with land line through carbon block part of lightning arrester, and went down river.

We could get no indication from the south, but had succeeded in working with Misamis through the supposed repair. We found the splice about completed, the break having been correctly located. The badly snarled portion showed it was broken by the *Grace* propeller. Returned to the ship by 6.30 p. m. About 30 knots of cable turned over from forward to main tank during the day.

February 7.—Sailed for Yligan at 6 a. m. Heavy mist and rain set in. Laid off Yligan from 9 a. m. to 2 p. m. Party went ashore and found wharf and beach torn up by storm of February 2. Test showed Cagayan cable broken close in to Yligan. Rain still continued. Laid off Yligan until next day.

February 8.—Mr. Winter and party went ashore and examined cable at beach, not finding any trouble. Lieutenant Binkley and party went ashore in afternoon and took up buried end to office, finding no trouble. Test with Weston instruments indicated fault to be 93 ohms out (about 4 knots). Shore end covered up again.

February 9.—Began grappling about $2\frac{1}{2}$ knots out. Hooked cable about 9 a. m. Cable broke to seaward in heaving in. Brought up bight; cut and buoyed the ends. Spoke Yligan all right, showing fault to be still farther out. Picked up buoyed sea end and began hauling in.

Broken end came aboard at 4 p. m., 447 revolutions of drum (1.38 knots), sounding 270 fathoms. Broken end showed clean conchoidal fracture of core (kerite); apparently not a fresh fracture. Proceeded to a point about 1 knot north and again grappled. Hooked cable about 5.30 p. m., but it slipped from grapple. Put down mark buoy and lighted both buoys. Laid off shore during night.

February 10.—Began grappling about 7.30 a. m. Caught cable at 8.30 about 1 knot north of mark buoy. Bight cut and south ends buoyed. Cagayan end brought to testing room. Could not raise them in fifteen minutes' calling. Made a rough estimate of the resistance, as follows:

	Ohms.
43 knots cable at 23 ohms.....	989
$2\frac{1}{2}$ miles land line (Cagayan).....	50
Office instruments (Cagayan).....	150
Total.....	1,189

A measurement showed 1,180 ohms, showing that failure to answer was due to improper adjustment or lack of attention at Cagayan, so splice was proceeded with to kerite end of after tank. Splice completed at 11.15 a. m.

Reached buoyed Yligan end 1.20 p. m., 1,154 revolutions of drum. Spoke Yligan and could get indication of Cagayan working. Measurement showed normal resistance to Cagayan; so final splice (rubber to kerite) made and overboard by 3 p. m.

Party went ashore to open communication with Cagayan if possible. Buoys picked up by 4 p. m. Party returned and reported the lines working all right.

Spoke the gunboat *Samar*, coming from Cagayan, Major Pershing, of General Kohbe's staff, on board, coming to make inquiries concerning repair of cable. Sailed for Zamboanga about 4.30 p. m.

February 11.—En route for Zamboanga. Turning over cable from forward to main



UNITED STATES CABLE OFFICE, MISAMIS, MINDANAO, P. I., JANUARY 1, 1901.



tank. At about sixty-third knot from top of tank the fault came up. It was near the middle of a flake. The outer serving was off for about 6 inches; the armor wires showed it had had a severe wrench, two being broken. The core was exposed and gouged out, exposing the conductor, evidently the fault of the person loading the cable. Arrived at Zamboanga about 7.30 p. m.

February 12.—Office established on first floor of post headquarters building. Table and shelves put up, a railing built, etc. Two double-current sets installed, and 50 cells Gonda battery set up. Shore end carried out from ship on three ship's boats, landed near the corner of the fort nearest the office, and going from there in a trench dug 250 yards to the office. The last 300 feet was lead-covered cable, which was carried into the office through an iron pipe.

February 13.—Sailed at 5.45 a. m., taking soundings toward Tukuran.

February 14.—Off Flecha Point. Turned around and started sounding back toward Zamboanga. 4.50 p. m., stopped near Sibago and Lanhil Islands.

Buoy placed and cable prepared for paying out from main tank. Seventy-four revolutions of drum carried forward and astern. Anchored S. 75° E. of the buoy.

February 15.—Weighed anchor at 3.30 a. m. Buoy raised, cable attached to chain, and large buoy lowered. Started paying out at 5.20 a. m. Stopped at 8.15 p. m. Cut and buoyed cable end. Laid off Flecha during night.

February 16.—Took up end of cable and heaved in 450 on drum. Paid out again and buoyed in deeper water. Sailed for Tukuran, taking soundings.

February 17.—Office on shore fitted up in corner room on the upper floor of building used as barracks and quarters, situated in a stone inclosure. The post is up a steep hill about half a mile from landing.

Lieutenant Hathaway fitted up the office with shelves and table; one polarized relay set for cable, one ordinary relay set for Lintogup land line.

Sixty-four Gonda cells were installed for operating the double-current system. Lieutenant Binkley made tests on telephone line running to Lubig, a station on land line to Lintogup. A party from there were repairing toward Lintogup. Twenty native laborers were hired to dig a trench to the landing for lead-covered wire; 3,300 feet of lead-covered wire sent for; shore end landed from ship by 5 p. m. This was done by running a line ashore, coiling a half mile of shore end in small boats, first splicing shore end to small cable, then landing small boats, attaching end to shore, and hauling in all slack in cable.

Ship then paid out half mile more of small cable and buoyed it at 6 p. m.

February 18.—Landed lead-covered wire and supplies 7.30 a. m.; Lieutenant Binkley, splicing party, and eight natives left ashore; work on trench continued. The lead cable was laid by being coiled in a wagon and paid out along trench from that. Communication opened with Misamis 10 a. m. Ship started to take soundings 8.25 a. m., returning to anchorage at noon.

February 19.—Lieutenant Binkley remained at Tukuran. Privates Long and Sickafus detailed as operators at Tukuran. Splice completed and preparations to lay from main tank finished at 7.48 a. m. Started laying cable toward Zamboanga.

End of main tank reached 1.50 p. m. Just before end went over communication was lost with Tukuran. Test showed high resistance of conductor and low insulation. Began heaving in and cutting to find fault. 4.937 knots (1,600 on drum) hove in before fault was in.

Mr. Winter and Seaman Kock took a small boat, to which end of cable was lashed, and spent the night in it. Ship laid near boat during the night.

February 20.—Picked up the end of cable attached to small boat and opened communication with Tukuran. Spliced sea end to forward tank and prepared to lay over the bow.

Stopped at buoy off Point Flecha. Splice made and overboard at 3 p. m. Sailed for cable end near Zamboanga. Arrived off the buoy during the night.

February 21.—Picked up buoy at 6 a. m. Communication opened with Tukuran at 6.40 a. m. Spliced with forward tank and began paying out over bow at 8.15 a. m.

Arrived off Zamboanga 12.30 p. m. Buoy taken up and shore end on board at 1 p. m. Final splice over at 2.15 p. m. Party sent ashore to connect office reported communication established with Tukuran at 2 p. m. Total count of cable by drum, 44,030 (about 136 knots). To this is to be added 1.5 land miles of shore end, 2,950 feet lead-covered cable at Tukuran, and 260 feet lead-covered cable at Zamboanga.

February 22.—Holiday. Dressed ship, fired a salute at noon. Entertained a party of officers, Datto Manda, and other Moro dignitaries from shore.

February 23.—Trouble in Zamboanga office due to wrong plugging of switch board. Removed promptly, and positive instructions given for future guidance. A land line was run from office to a point on the beach about a quarter of a mile west of Magay, the Moro part of town, where a cable hut was erected.

About 1½ miles of No. 9 iron wire used in the line, supported on iron poles. Sergeant Akers put in charge of Zamboanga office, assisted by Private Spillane. Sergeant Akers took charge of portable set to be used at hut while Jolo cable was being laid.

February 24.—Started paying out shore end from ship at 5 a. m., using square lighter to hold shore end. Much delay caused by underestimating length of shore end required. Started paying out toward Jolo from forward tank.

Cable cut and buoyed for the night at 7.05 p. m. End of forward tank here.

February 25.—Start at 5 a. m. Buoy picked up and communication with Zamboanga opened at 6 a. m. Splice to after tank over and began paying out 7.50 a. m.

Stopped for sounding 4.35 p. m.; 49 fathoms. Cable cut and end buoyed. Anchored for the night 2 miles from buoy.

February 26.—Buoy picked up by 6 a. m. and communication opened with Zamboanga. Splice completed and over by 7.55 a. m. Continued laying toward Jolo.

Stopped 1.57 p. m. off Jolo. Anchored. Serving very bad on cable for about 12 knots. Shore end (276 on drum) placed on small boats and landed about one-half mile north of walled town. Cable paid out to ship where deep-sea end was spliced on that night. Three hundred revolutions more paid out to make the splice. Office selected in upstairs rooms of cuartel.

February 27.—Lieutenant Hathaway and party set up the usual equipment of shelves and tables. One polarized relay set and 30 Gonda cells put up for working single current. Party sent up beach to open communication with Zamboanga succeeded in doing so at about 11 a. m. About 30 natives hired to dig trench; half finished by night.

February 28.—Trench completed, 2,625 feet of lead-covered wire spliced to shore end, carried through trench to office, and covered over. Connections made and working perfectly by 3 p. m. Privates Sheridan and Dauler installed as operators. Total deep sea laid Jolo-Zamboanga 28,335 on drum (87.45 knots); 1.7 knots of shore end laid.

March 1.—Sailed for Zamboanga 2.30 a. m. Arrived at Zamboanga 2.30 p. m. Lieutenant Binkley at Tucuran reported result of test the day before. Using Weston millimeter on Tucuran-Zamboanga cable with Zamboanga grounded 50 volts and 20 milliamperes; Zamboanga free 53 volts and 24 milliamperes. This indicated leak somewhere. Received orders to proceed at once to Bongao to take Jolo launch off the rocks at Bongao Point. Sailed 8.30 p. m.

March 2.—En route for Bongao in Celebes Sea in sight of Basilan and Jolo group to the westward.

March 3.—Passed to the east and south of the flat coral group south of Tawi-tawi. Last 15 miles course northward to Bongao. Reached Bongao 2.30 p. m.

March 4.—Ship's crew worked on the half overturned and stranded *Maud* all day.

March 5.—Leaks stopped, the *Maud* righted and off the rocks by 6 p. m.

March 6.—Sailed for Dumaguete at 8 a. m., taking the passage west of Tawi-tawi, Jolo, and Mindanao. Rough weather.

March 7.—En route for Dumaguete. Arrived Dumaguete late afternoon and anchored. Received report of break in Iligan-Cagayan cable; also of leak in Zamboanga-Tucuran cable.

March 8.—Uncovered trench and prepared to pull short piece of shore end out to sea. Reconstruction of land line completed, two wires instead of one being run to hut from office. Another short piece was spliced on shore end and the end carried to ship. Total length of shore end 0.62 knot. During night ship was joined with Misamis, who cut through at cable hut and Iligan cut through to faulty cable, permitting it to be tested from ship.

March 9.—Started paying out shore end 6.40 a. m. Course N. 35° E. Buoyed shore end 7.30 a. m. Continued north sounding until 10 a. m. Sailed from last sounding for Cebu, where we arrived about 4 p. m.

March 10.—Sunday.

March 11.—Began coaling. Began testing up short lengths, splicing and coiling all rubber cable in main tank. All Kerite cable in forward tank. Report great difficulty in working through Zamboanga-Tucuran cable.

March 12 to 16, inclusive.—Coaling.

March 17.—Sailed for Oslob at daylight and arrived early afternoon. Went ashore with office material, and under Lieutenant Hathaway's direction an office was established in the convent. Shelves were put in, a two-line switch board, thirty Gonda cells, and a polarized relay; single current set. Hut erected on beach about one-fourth mile south of convent, and land line built.

March 18.—Went ashore about 6 a. m. Finished office, trench, and hut. Cable landed; about 200 yards spare shore end buried near hut. Shore end spliced to deep-sea end in main tank. Weighed anchor at 10 a. m. Commenced laying cable toward Dumaguete. Reached buoy at Dumaguete at 1:50 p. m. Went ashore with party and connected up for working through from Misamis to Oslob. Great diffi-



INSURGENT PRISONERS TRENCHING SHORE END OF CABLE, MISAMIS, MINDANAO, P. I., JANUARY 7, 1901.





LIGHT-HOUSE AND SIGNAL STATION, JOLO, P. I., FEBRUARY 27, 1901.

culty experienced due to changes in circuits made by Misamis and Dumaguete operators. Finally straightened out and communication through at 5:40 p. m. Sailed at 6:30 p. m. for Zamboanga.

March 19.—En route to Zamboanga. Arrived there about 4 p. m., and went ashore to prepare for tests. With Weston instruments found that fault could not be more than 2 knots out. Ran a double conductor light cable ashore from ship. Tests gave about 1 knot out. Breaking of cable, due to ship's surging, ended testing.

March 20.—Underran shore end to point about three-fourths mile out. Test cable run out to lighter, when shore end was cut and test showed it all right toward Tukuran. Party went ashore and dug up splice between shore end and lead-covered wire. Test showed shore end all right. Test from office then showed that fault was in lead-covered cable. This cable was dug up and fault found to be due to punctures from sharp stones in filling up trench. Two hundred and fifty-eight feet of lead-covered wire was brought from ship and spliced on in place of defective piece. Test made that night showed insulation to be all right, but resistance was 400 ohms higher than normal, due probably to Tukuran instrument being in.

March 21.—Sailed at daylight for Cagayan, Mindanao. En route all day.

March 22.—Reached Cagayan 4 p. m. Captain Squier and party proceeded to hut to test with Weston instruments. These gave indication that a break existed not more than 3 miles out. Core was run from ship to hut, and test showed that break was probably within a mile of the beach. Mr. Winter and party underran cable for about half a mile.

March 23.—Mr. Winter and party underran cable to a point about one-fourth mile beyond shore end and attached bight to small boat. The ship then went to a point about three-fourths mile farther out and proceeded to grapple, but could not hook the cable. Then proceeded to boat, cut at bight, buoyed the shore end, and proceeded to pick up sea end, which came on board at 321 revolutions of drum. The end showed evidence of breakage due to heavy strain. The conductor projected about one-third inch. Anchored for the night, having placed buoy near point where broken end came on board.

March 24.—Grappling for sea end of broken cable. Hooked it at 10 a. m. in 160 fathoms. Bight brought up at 10:45 a. m. Communication with Misamis at 11 a. m. Completed splice at 12:15 p. m. with Misamis end and Kerite cable forward tank. Began paying out at 12:20 p. m., first having buoyed end toward break. At 1:54 p. m., having gotten Iligan to free, test showed fault toward Iligan of resistance varying between 30,000 and 1,900 ohms. Went back to anchorage and carried a piece of Kerite cable ashore as lead to cable hut from the ship's testing room. Test indicated a fault close in of very low resistance.

March 25.—Continued testing during forenoon and located second fault close in. Mr. Winter and party underran out a little beyond original shore-end splice and, assisted by signals from testing room, located and cut out fault. The piece of core shows a number of cracks which exposed the conductor and many incipient faults which would become serious by handling.

March 26.—Proceeded to pick up buoys and remaining piece of broken cable. In recovering broken piece a large tree was brought to surface around which the cable was tightly wrapped 4 or 5 turns. Thirty-six turns farther on the broken end came aboard, giving the same evidence of having been broken by a severe strain as the other end. Drum registered 345 revolutions in recovering this piece, making a total of $321 + 345 = 666$ turns recovered, 666 turns paid out. The other buoy having been picked up, we sailed for Iligan. Arrived at Iligan about 4:30 p. m. and put end of core ashore for making tests. During the night the tests showed the fault to be 8 or 10 miles out in deep water.

March 27.—In view of the brittle nature of the Kerite, it was thought that numberless other faults might be produced in an attempt to raise it, so it was decided to cut the line in Iligan office, put in another set, and work with lowest battery power possible, to prevent the fault being "opened up." A polarized relay set was put in. With this it was found that with 10-cells battery at Cagayan and 12-cells battery at Iligan (both carbon to line) it worked very easily. We sailed for Pasacao at 9:30 a. m., taking the route north of Mindanao, west of Negros and Panay, north of Tablas and Romblon.

March 28.—En route to Pasacao. Very quiet seas and beautiful weather.

March 29.—Reached Pasacao about 4 p. m. Went ashore and set up shelves, 20 cells of Gonda battery, polarized relay, and switch board. The office was rewired. Tests were made with Weston instruments indicating fault to be about 12 miles out. The buzzer had been used successfully about five months on this very leaky cable, maintaining almost constant communication.

March 30.—Proceeded to a point about 12 knots out from Pasacao and hooked cable

at first drag. Cut and buoyed Pasacao end. Test showed a fault toward Guinayangan. Took up 586 turns, and having found no trouble paid out 234 turns; cut and buoyed cable. Sailed for Guinayangan about 12 noon, arriving about 3.36 p. m. Went ashore and put in polarized relay, switch board, and set of shelves. Twenty cells Gonda battery were set up and office partly rewired. Rough test showed a fault close in, not over $\frac{1}{4}$ ohms resistance.

March 31.—Underran cable to a point about 1 mile out in small boat. No result visible on Weston instruments during underrunning. Meantime the office had been completely rewired and put in good condition by Lieutenant Hathaway and party. The cable was taken out of the trench from water's edge to office and no trouble observed. It was then covered up and cut at low-water mark. Test showed shore piece all right. The afternoon was spent in further underrunning, having shown by cutting and test at small boat about 1 mile out that fault was within that distance.

April 1.—Three faults were found and cut out in the first mile from shore, all at and near a splice. In addition to leaks in the insulation the conductor at the splice seemed to be corroded off. Splices were made and the underrunning continued to a point about 2 miles out where the ship could go. The cable was cut at small boat, and a core lead run from the ship's testing room. Tests showed fault out to sea.

April 2.—Leaving ends in boat, another small boat underran outward about $1\frac{1}{2}$ knots, finding no evident fault. The ship was moved to new position and found cable faulty both ways. Faults developed in the lead that p. m., making it necessary to haul it in for repair.

April 3.—Faults having been cut-out of lead it was taken out to small boat and tests showed that cable was sound in shore and faulty south. Proceeded to take up cable south when a bad fault was brought in after about 1 knot had been recovered. Upon testing, a high resistance fault was found to still exist south. It was decided to let this remain. Small rubber cable from main tank was spliced to sea end. Began paying out 6.15 p. m. Course N. 60° W. Paid out 551 revolutions of drum to small boat where shore end was brought up and splice made.

April 4.—Sailed at 3 a. m. for buoys nearest Pasacao. Reached north buoy at 5.30 a. m., took it up, spoke Guinayangan, and tested, finding everything right except the high resistance fault. Put buoy over again, proceeded to south buoy, took it up and tested. Faulty cable toward Pasacao. Recovered about $1\frac{1}{2}$ knots cable. Cut and tested again. Fault still out. Buoyed end and went south about 7 knots, where grapnel was rigged and cable caught the first drag. Spoke Pasacao and found good cable that way. Began recovering cable north and brought fault in about 1 knot. Meantime all pieces of good intermediate cable had been spliced and put in main tank. North end was spliced to this and paying out began at 9.30 p. m. Sailed for nearest buoy, Guinayangan, 12.10 a. m.

April 5.—Spliced to main tank and began paying out about 4.30 a. m. Paid out 916 revolutions intermediate (old) and 112 small (new) cable to other buoy. Final splice completed at 7.20 a. m. Went to Pasacao and found line working well. Had both stations cut batteries to 12 cells with good and strong working. Sailed for Manila at 10.15 a. m.

April 6.—Arrived at Manila 10 a. m.

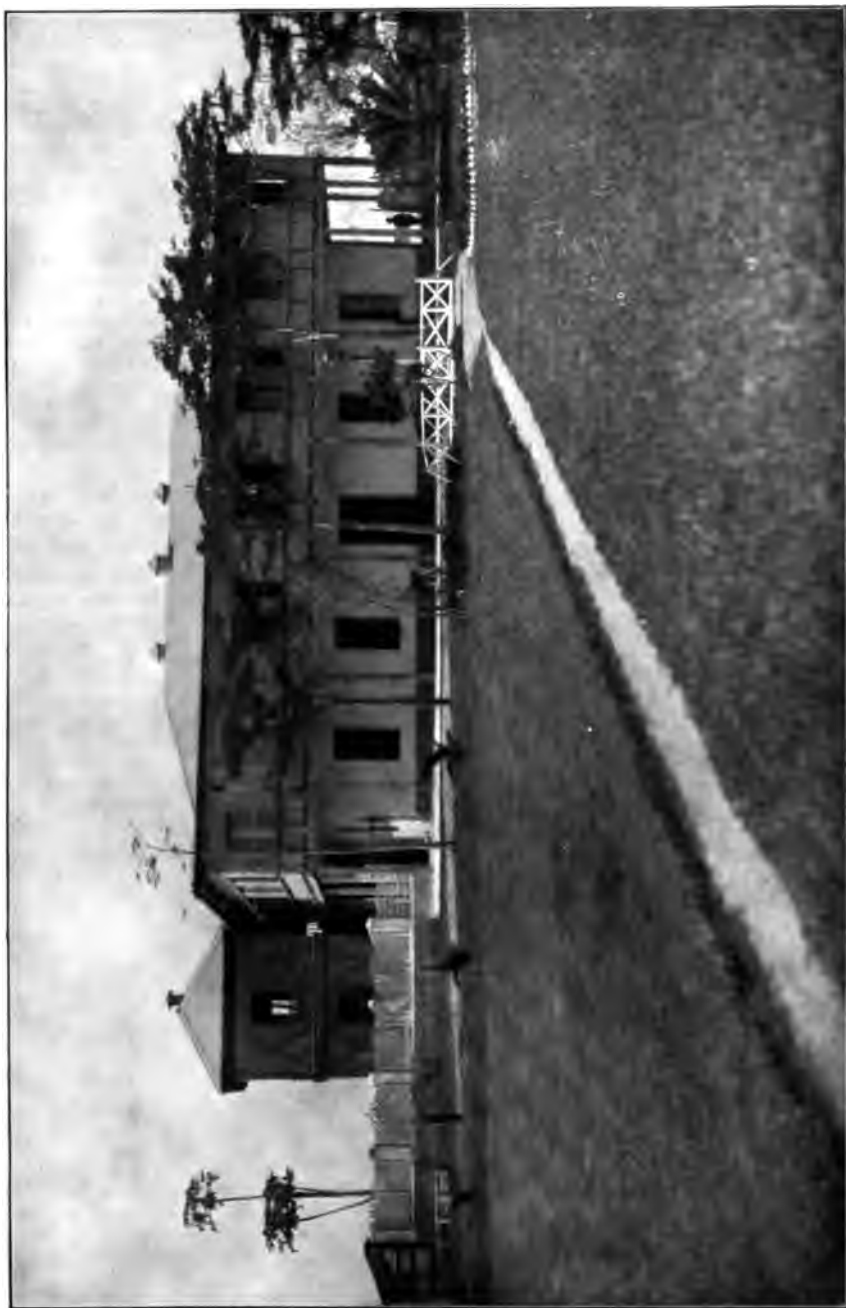
RECOMMENDATIONS REGARDING MORSE INSTRUMENTS FOR USE IN THE CABLE OFFICES.

Keys.—Those furnished are of the open-circuit variety, with legs for connecting under the tables. The following faults in their construction were evident: The springs were very weak and so insecurely fastened that they were constantly losing out. The coil spring should be used and securely fastened. The rubber bushing around the lower contact points are entirely too thin, causing frequent short circuiting with the body of the key. Lastly, the legs were too weak where joined to top connection, and broke off in several cases. The entire key seemed to be too flimsy and light in construction.

For double-current working where a switch must be used, the modification of the open-circuit key dispensing with the separate switch (per working drawing "A" attached) is suggested as suited to the practice of American operators accustomed to the ordinary closed-circuit key.

Polarized relays.—Those furnished were quite well made. The armature and tongue should be made lighter, and the armature pivots should be carefully finished, as several of them worked very stiffly. As little readjustment is required when once working well, it is recommended that these instruments be provided with glass covers. The glass-covered English (Siemens) type of polarized relays seems to be more delicately and neatly made, and work with less current than the "W. U." type furnished us.

Sounders.—Very well constructed instruments furnished. Recommended that they



HEADQUARTERS, AND UNITED STATES SIGNAL CORPS CABLE OFFICE, ZAMBOANGA, MINDANAO, P. I., FEBRUARY 12, 1901.



be wound to 6 ohms instead of 4 ohms to correspond with the higher E. M. F. of battery (Gonda) used. Four-ohm sounders, by allowing an unnecessarily large current to run, use up the local batteries rapidly.

Batteries.—Gonda cells appear to be well suited to this kind of service. The only modifications suggested are that the zincs be made somewhat heavier and larger at the top than the bottom. Some salt, such as the Le Clanche-Barbier variety, may have less tendency to clog the depolarizing prisms than the sal ammoniac.

Switchboards.—Those furnished being intended only for land-line work proved entirely inadequate for cable service both as regards insulation and certainty of contact. Something in the line of hard-rubber bases, cable binding posts on pillars, and good solid contacts when measurements are being made is required.

The following design (see working drawing III and specifications attached) is submitted as fulfilling some of the service conditions met with in this climate.

Lightning arresters.—Flimsiness in construction and utter unreliability of contacts have caused trouble in nearly all lightning arresters furnished. These were porcelain base, carbon block, fuse arresters. For instruments that must be left without continuous inspection, as in the case of cable hut arresters, nothing but the strongest and best workmanship will suffice. Some delicacy of action must be sacrificed for security. So the fuses should be not less than one-half ampere, and the carbon block jump arresters should be separated by somewhat thicker strips of mica than is customary. The fuses should be very carefully made, the spring clips strong and positive in action, and good binding post terminals put on in place of the cheap and wretched screws that were hard to get at and continually working loose and breaking.

The whole affair should be much larger, stronger, and better finished than the ordinary commercial arrester.

Repeaters.—For connecting up two single current lines (open circuit) two repeating sounders with front and back contacts are all the additional pieces of apparatus required in the repeater office. The connections are very simple (see page 175, Text-Book of Science, Telegraphy, Price & Sivewright). In repeating between open-circuit lines, one or both of which are double current, much more complicated apparatus is required. Still it is not more so than repeater sets for closed-circuit work, and if required could be set up and would undoubtedly work satisfactorily.

The circuits are diagrammatically shown on page 182, Price & Sivewright's book on telegraphy, before mentioned.

ALTERNATIVE APPARATUS FOR IMPORTANT CABLE OFFICES.

In case of a heavy escape which interrupts working with Morse instruments, two methods of working, pending regular cable repairs, are possible.

For short cables the service type of "buzzer" may be employed. For example, on the Guinayangan-Pasacao cable for five months after the breakdown of the Morse it was possible to maintain communication with buzzers.

For office purposes Colonel Allen suggests a table set with approved form of regular key, and spare parts, such as springs, diaphragms, &c., to be inclosed in a neat box for transportation. For cables more than 50 knots in length the buzzer would be choked down too much. In this case a simple and cheap form of mirror receiver would be best, the operators using it on the wigwag principle if unacquainted with the usual methods of receiving on this instrument. A switch could be used to throw the mirror into line for daily test and practice, and upon interruption of the Morse, it could be agreed that in, say one hour, the mirrors would be thrown into circuit, all intermediate Morse stations unprovided with mirrors to be cut out while the mirror stations were working.

Office wire.—Only heavy rubber insulated and braided should be used. The paraffin-covered wire is entirely unsuited for use in this moist, warm climate.

All instruments for use on cables should be stamped "For use on cables" and packed in boxes separate from land-line apparatus, these boxes being plainly marked with the same words.

All instrument springs should be of spring brass, or, better, of phosphor bronze. Steel rusts out very quickly in this climate. Nickel plating seems if anything, to hasten the rusting of steel parts.

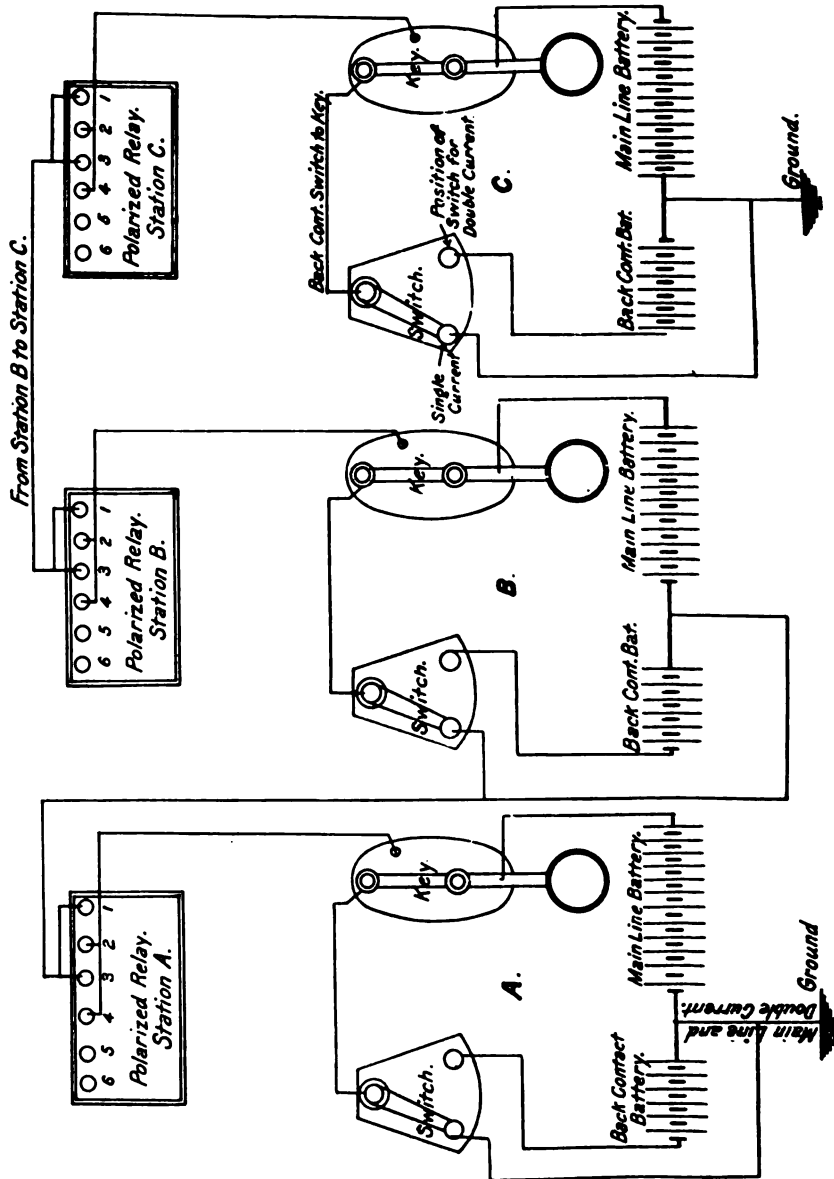
CONNECTIONS OF OPEN-CIRCUIT SYSTEMS FOR EITHER SINGLE OR DOUBLE CURRENT WORKING.

With switches as shown in the Diagram II, the system works as single current. Care should be taken that batteries and relay connections are so arranged that the polarized relays work "direct" either in sending or in receiving.

The back contact batteries for double current working are connected as shown. The battery pole toward the switch is the opposite kind to the one connected with

front contact of key. The back contact battery should have from half to two-thirds as many cells as front contact or main battery.

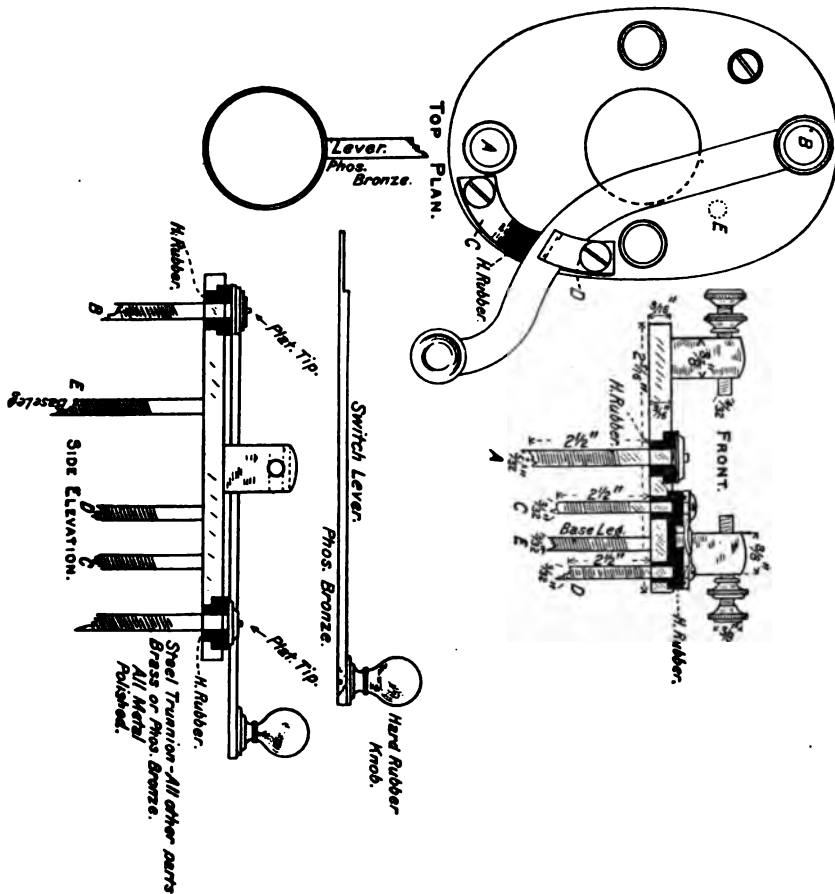
The switches are kept as in diagram when using single current; also when receiving in double current. For double current sending at any station the switch is turned to right, thus bringing both front and back contact batteries into use. It is turned back to the left when through sending, as the circuit closer would be in the ordinary key.



II. Three station wiring plan single and double current sets.

The advantages resulting from more rapid working and the self-adjustment of relays when using the double current will be noted on all but the shortest cables. In these latter the single current will be sufficient.

With relay connected to "E," one pole of main battery to "A," earth to "C," and one pole of back contact battery to "D," the key is suited for open circuit working either single or double current. (Single current with switch closed to left. By opening switch to right the back contact battery is put into circuit for double-current



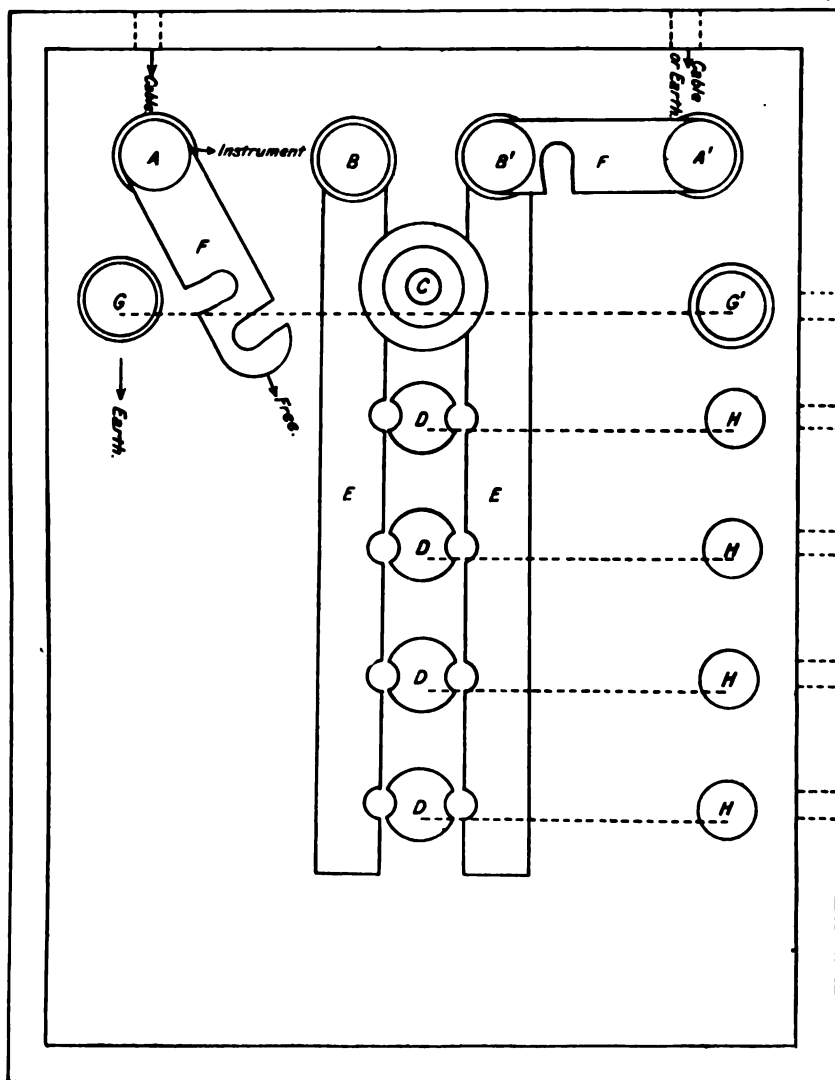
Combination key for open or closed circuit (single or double current).

sending). By connecting "A" and "C" together, and "E" and "B" together, it may be used as an ordinary closed circuit key, "A" and "B" being the points connected with line and relay respectively.

SPECIFICATIONS FOR CABLE SWITCHBOARD.

Base of hard rubber one-half inch thick. Metal fittings and binding posts of polished brass (A, A', B, B', G, G', C, D, E, H,) F F copper connecting straps.

A cover about 4 inches deep made of mahogany, with a glass front, is made to fit over hard-rubber base. The large binding posts are of the usual testing set or shouldered pattern. Holes are provided for the leading-in wires as shown, and the words "cable," "instruments," "earth," etc., are stamped on the base.



Cable Switchboard.

NOTES ON CABLE INSTRUMENTS.

Three methods of operating cables may be used, according to the conditions governing: (1) Single-current open-circuit sets; (2) double-current open-circuit sets; (3) recorders.

The first is limited to cables less than 100 miles in length. Hence, except for

branch lines, on account of the numerous repetitions required it is not recommended for lines included in the general system, or trunk lines.

The double current will operate satisfactorily up to 300 miles' distance and will serve for any proposed section given in the table. For instance, Manila to Sorsogon, 6 stations, 259 knots; Sorsogon to Tacloban, 6 stations, 250 knots; Tacloban to Cagayan, 5 stations, 276 knots; Cagayan to Zamboanga, 5 stations, 255 knots; Zamboanga to Bongao, 4 stations, 265 knots.

For short cables, suitable for single-current operation, the following stations of the proposed system are given: Turcuran-Malabang-Cottobatto, 67 knots; Zamboanga-Isabella, 19 knots; Misamis-Dumaguete (now laid), 98 knots; Dumaguete-Cebu, 87 knots; Argao-Ormoc (now laid), 60 knots; Corregidor-Marivales-Olangapo, 46 knots; Bangui-Aparri, 75 knots.

The great disadvantage of working the ordinary polarized relays on these cables, especially in the long trunk lines, is the comparatively large amount of current required. No instruments at present used operate satisfactorily on less than 15 milliamperes.

Taking the proposed type of cable (11 ohms per knot) on the Manila-Sorsogon section, with 6 stations, 61 volts (40 Gonda cells) is required at each station to give the required current on "front stroke" and about 25 to give the "back stroke." The 6 stations of this section alone require 390 cells battery, and the 26 stations of the main system would need 1,690 cells. It is possible, though it has not yet been positively ascertained, that relays can be made which would operate on a third of the current stated, or 5 milliamperes. The large battery required is, however, the least of the evils, for, as is well known, a current of even 5 milliamperes will tend to open up and develop any incipient faults, while the present practice of 15 milliamperes certainly put a greater strain upon and will shorten the life of the cable very seriously.

In the recorder we have the highest type of cable instrument, in that it works with a current less than a milliampere, that it can be worked on cables of all lengths, when once adjusted will make legible signals under widely variant conditions of current and leakage, and keeps permanent record of all business. The regular types of siphon recorders now in use on long cables, with vibrators, are much more delicate, intricate, and expensive than those necessary for the short inter-island cables. Instead of five lines and four repetitions between Manila and Bongao (Jolo), but two repeating stations need be kept up, namely, Tacloban and Zamboanga. At each of the stations either of two types of the "direct writing" permanent magnet recorders described in works on submarine telegraphy seem to be suitable—those made by the Muirhead Company, London, and James White, Glasgow. Each of these instruments seem to be about as compact and simple as the ordinary ink writer register, and are capable of working at a rate of 200 words per minute on cables less than 500 miles in length. This would permit them to be used, if desired, as receivers for machine telegraphy by either of the well-known methods, Wheatstone or Sine-Wave. It will be necessary to go into an investigation of these modern methods to determine fully which is best suited to our needs. Against the advantages of speed, correctness, and permanent record we have the sole disadvantage of our present lack of operators skilled in tape reading and management of this class of instruments. It is submitted that if the need comes, the comparatively slight additional training that good operators will require will not stand in the way of the introduction of the better type of instruments. The experience of cable companies seems to have been that the recorder type must displace all other instruments.

NOTES ON ELECTRIC HEATING DEVICE FOR CURING (VULCANIZING) JOINTS IN RUBBER CORE.

Formerly the vulcanizing was done in a paraffin bath heated by a three-burner kerosene lamp stove. In the wind, or if the sea was at all rough, it was impossible to use this, and under the best circumstances seldom, if ever, was the vulcanizing temperature of 280° F. reached. At least half an hour was necessary to get even the low temperature ordinarily used. The result was that many of the joints dissected showed the red vulcanizing rubber retaining its color, showing imperfect curing.

The vulcanizer adopted in place of this consists of two small boxes, hinged, with the open tops closing together. Brass plates, each with a semicircular longitudinal trough in it, cover the boxes, and when closed the troughs form a tube about five-sixteenths inch diameter. In the boxes back of each semicircular trough are strips of asbestos wound with about No. 28 iron wire. These wire-wound strips are pressed against the troughs, the troughs first being covered with asbestos insulation. The boxes are filled with asbestos. The ends of the wire are attached to binding posts near the hinges, the resistance being about 30 ohms. The current through two 32-candlepower lamps in parallel heats up the trough to vulcanizing temperature in

about fifteen minutes. The finished joint, wrapped in three thicknesses of cotton, is put in, the vulcanizer firmly closed, and in twenty-five minutes the vulcanizing is completed. An examination of this joint shows the vulcanization to be perfect, and a homogeneous joint to be the result.

NOTE ON ADDITIONAL EQUIPMENT, ETC., REQUIRED.

Burr-Stroud range finder for use on the bridge.—This instrument, consisting of two small telescopes connected with a horizontal tube and fitted with an eyepiece in the center, has been largely adopted by foreign navies and very favorably reported upon by ours. It gives distances up to 5 miles with a very small percentage error, and distance can be read off continually without tables or computations. It is "direct reading." Not only would it be valuable for all our plotting work, in laying shore ends and making harbor maps, but it would be of great assistance in navigation, especially at night, when the distance of a light on shore could be at once ascertained.

Speed indicators for drum and screw.—These give at once the relation between the speed of the ship through the water and the rate of paying out cable. At slow speed it has been found that the ordinary log varies widely from the truth.

Drafting room.—A room fitted out with large chart tables, drawing boards, and instruments for keeping a continuous and accurate chart of the positions of cable during laying is much needed.

Electric signaling devices.—A complete conduit system of wiring should be put in, connecting all tanks, the bow sheave, and the stern both with bridge and take-up gear. Small annunciators on the bridge and at the take-up gear would show at once where the signal was given and secure against false signals.

Electrically operated semaphores (such as collapsing drums) during the day and Ardois or two-light signals at night would be much better for communicating with shore than any flag or makeshift system. Experience has shown the need of good signaling devices.

The photographic department should be overhauled and a completely new stock of plates, paper, and chemicals should be put in before the next important cable laying. A larger printing frame, capable of reproducing maps up to 3 by 5 feet, should be purchased or made.

QUARTERS.

The quarters are not adequate for permanently organized cable party. For example, the sergeants and first-class sergeants, whose duties are in some instances more important and exacting than those of any of the petty officers, are not provided with stateroom accommodations. The quarters question of the natives is even more serious. These men have absolutely no quarters, and sleep anywhere they can find a corner. As a consequence it is impossible to have any vigorous inspection or hold them up to any standard of cleanliness. Furthermore, when divided into shifts for the continuous work required many times, the shift off duty can not get any sleep in the daytime between decks, as they are right in where the carpenters and plumbers are working and everyone passing through. While this state of affairs may be borne for a few weeks, much trouble and falling off of efficiency results if the time of the work extends into months.

RECOMMENDATIONS REGARDING PERSONNEL.

As Lieutenants Hathaway and Binkley were under my immediate observation and orders, I desire to express my appreciation of their excellent services.

Lieutenant Hathaway has established a model series of offices, which for neatness in installation and sound and strong wiring and fitting are worthy of admiration.

Lieutenant Binkley in rapid and efficient work when trenching, constructing land lines, or assisting the cable engineer has shown great aptitude for these duties.

Lieutenant Jones has, in addition to his duties as property and disbursing officer, given valuable assistance on the ship in cable laying and timely aid on shore on several occasions.

The men have shown a praiseworthy zeal in their duties. All have worked well. Those specially deserving mention are First-Class Sergeants Bohler and Akers, Corporal Hunter, First-Class Privates Luckett, Sheridan, Spillane, and Sickafus, and Second-Class Private McKinney.

In conclusion I desire to express my appreciation of the uniform courtesy and many favors extended to me in the performance of my duties by Maj. J. C. W. Brooke, quartermaster, United States Volunteers, and the ship's officers.

Very respectfully,

EDGAR RUSSEL,
Captain, Signal Officer, U. S. F.

APPENDIX No. 10.

EXTRACTS FROM REPORT OF CAPT. E. B. IVES, SIGNAL CORPS, ON SIGNAL CORPS OPERATIONS IN NORTHERN LUZON, PHILIPPINE ISLANDS.

JUNE 30, 1901.

The jurisdiction of the signal officer of the Department of Northern Luzon extends over the machine shop and the main telegraph office in Manila and the Department of Northern Luzon. It is divided into six districts, under charge of Capt. Edward B. Ives, Signal Corps, United States Army, assisted by Lieut. Basil O. Lenoir, Lieut. R. O. Rickard, and Lieut. Charles B. Rogan, jr., Signal Corps, United States Army, and Sergt. Charles F. Mason.

For convenience the report is arranged by months.

JULY, 1900.

The insurgents have been very active during the month in the province of Ilocos Sur, repeatedly cutting the wire, removing poles and wire, causing considerable hard work on the part of the corps, but very slight interruption of communication has been experienced. On July 26 the insurgents cut the line 1 mile south of Orani on the Angeles-Orani line, pulled the poles out of the ground, broke the insulators, and carried away 700 feet of wire. The line was promptly repaired.

Lieutenant Duffy and detachment completed the San Fernando-La Trinidad branch on July 11, 1900. While en route with Signal Corps supplies from Vigan for the Badoc-Currimao branch line, escorted by 17 men of Company C, Twelfth Infantry, Sergt. Warren Billman, Company F, Signal Corps, United States Army, was killed in ambush by the insurgents July 31, 1900. All supplies were captured.

Lieutenant Lenoir's party connected Pozorrubio telegraphically with Alava (distance, 6 miles) and San Manuel with San Nicholas (distance, 8 miles). Also changed 3 miles of line on the Bautista-Cabanatuan branch east of Rosales from the woods to along the road. This section has been practically rebuilt during July from Bautista to San Jose (distance, 80 miles). His party moved offices at the following stations, Tarlac, Bamban, Moncada, Paniqui, and Gerona, from railway to commanding officer's quarters. Total amount of new work done, 38½ miles.

On July 28, 500 feet of wire on the San Fernando-Lubao branch, about one-half mile east of Guagua, was destroyed, but promptly repaired.

The San Fernando-Aparri section was frequently cut during the month, a short distance north of Cabanatuan. Between the 20th and 31st this line was cut four times, poles cut down and wire carried away. The severe storms have done a great deal of damage on this line. On July 16 the line was down in five places near Cabiao, caused by falling trees. Considering the difficulties on this section, communication between Manila and Aparri has been well handled, the longest interruption not exceeding twelve hours.

NEW OFFICES OPENED.

San Isidro, province of Pangasinan; Convent (Malolos), province of Bulacan; Naguilang, province of Union; San Miguel, province of Ilocos Sur; Alava, province of Pangasinan.

STATIONS CLOSED.

Binmaley, province of Pangasinan; Cordon, province of Isabela.

Number of messages handled by the company during the month, 111,227. Full report not yet received.

Interruptions.

Date.	Place of interruption.	Damage.
July 8	2 miles south of Badoc	500 yards of line carried away.
July 9	2 miles south of San Quintin	600 yards line carried away.
July 11	2 miles north of San Quintin	700 yards line carried away and 2 poles destroyed.
July 14	Between Pidigan and Bangued	100 yards line carried away.
July 17	North of Cabiao	5 poles broken, caused by falling trees.
July 18	6 miles north of San Quintin	Line cut and taken away for a distance of 26 poles; all insulators broken.
July 21	2 miles north of Cabugao	Line cut by insurgents and 300 yards carried away; 2 poles down.
July 23	1 mile west of Cabanatuan	Line cut by insurgents and 3 poles chopped down.
July 26	1 mile south of Orani	700 feet of line carried away, insulators broken, and poles pulled out.
July 28	East of Guagua	500 feet of line carried away.
July 28	4 miles south of Badoc	1 mile of line and 6 poles carried away.
July 30	Near Talavera	Line cut and 300 feet of wire removed.
July 31	4 miles north of Cabanatuan	Line cut and twisted; 1 pole chopped down.

AUGUST, 1900.

Considerable trouble was experienced between August 9 and 16, due to high winds and heavy rains; nearly all lines on the island were prostrated. Communication was reestablished on the 17th. This was the most severe storm since the occupation of the island by United States forces, and the excellent work of linemen is worthy of mention.

The Novaliches telephone branch was cut three times between August 18 and 25 by insurgents, who removed several hundred feet of line.

On the Angeles-Orani section, between Dinalupijan and Florida Blanca, the line was washed away by the Goman River on the 26th. A new line was promptly built, and communication established on the 31st.

On the 29th 200 yards of wire and several poles were blown down on the Manila-Dagupan line at 11 a. m.; line repaired at 3.30 p. m.

Lieutenant Mitchell reports the following interruptions on his section: August 1, one-half mile of line cut down on the Cabanatuan-San Jose section by insurgents, 8 miles north of Cabanatuan. August 30, "River still high, lines on Cabanatuan-San Jose section and on San Fernando-Pantabangan section have been several times washed out. Line from Carranglan to Solano has been rebuilt and is now practically new."

Lieutenant Duffy reports almost daily onslaught upon the lines in his section by the insurgents, who not only cut the line but break the insulators at different places, thus rendering grounds. August 2, line cut near Badoc, 100 yards of wire missing, and 4 insulators broken. August 11, line cut 2 miles north of Cabugao, 35 yards of wire, 3 brackets, and 4 insulators missing. August 14, wire cut north of Lapo, carried away wire to length of 7 poles, 5 poles missing. August 16, wire cut 3 miles south of Badoc, 300 yards of wire gone, 1 pole chopped down, and 4 insulators gone. August 29, wire cut in the morning 3 miles north of Cabugao, 200 yards of wire taken, cut again in the afternoon, 5 poles down, wire removed, 3 insulators gone.

Lieutenant Yurgensen reports wire broken 11½ miles south of Botolan, province of Zambales, caused by high water.

Lieutenant Grabo and detachment of 5 men left Manila August 10 to accompany General Funston's expedition.

Lieutenant Rickard (attached) in charge of the Aparri-Solano section reports "no interruptions" with exceptions incidental to prevailing wet weather and lightning, which caused line to work heavy at times.

OFFICES OPENED.

Cordon, province of Isabela (reopened). Base hospital, Dagupan, province of Pangasinan (Relay office for Dagupan-Subig section).

OFFICES CLOSED.

Railroad office, Dagupan, province of Pangasinan.

Number of messages handled during the month, 112,237.

SEPTEMBER, 1900.

A severe typhoon raging for three days, 7th, 8th, and 9th, blew down 78 poles between San Fernando and Guiguinto, 3 poles between Tondo and Calocan, 11 between Balanga and Abucay, and prostrated nearly all the lines of the department. The very heavy rains accompanying the typhoon flooded the country, making anything but temporary repairs impossible for several days; even to accomplish temporary repairs men were compelled to work in water frequently from waist to shoulder deep. Communication on trunk lines was reestablished on the 15th.

Lieutenant Lenoir reports as having been engaged during the month in placing hard wood poles between Dagupan and Magaldan, Dagupan and Lingayen, also in the city of Dagupan. On the 29th started with the necessary material to construct telephone line from Alava to Rosario, province of Union. Replaced the river cable at the Dagupan River and at San Isidro, Pangasinan, with deep-sea cable.

Lieutenant Nordquist during the month was engaged in the supervision of the reestablishment of communication along the railroad after destruction by the typhoon and clearing the way for new lines.

Lieutenant Binkley was engaged during the month in constructing telephone lines between Manila and Pasig Ferry, Malolos and Poambon.

The signal detachment under Lieutenant Grabo, which was sent to General Fun-

ston for use during operations in the fourth district, was relieved on the 19th. Attention is invited to Lieutenant Grabo's report, copy inclosed herewith. The facility displayed by the detachment in handling plain text and cipher messages, also messages in Tagalog and Spanish, speak well for the thoroughness of their instruction. The destruction of the telegraph wires between Gaban and Penaranda furnished an opportunity for practical day and night signaling, and business between these points was expeditiously transacted.

The lines were cut by the insurgents during the month as per the following tabulation:

Date.	Place of interruption.	Damage.
Sept. 1	2 miles north of Siniat, province of Ilocos Sur.....	Slight.
Sept. 4	3 miles north of Badoc, province of Ilocos Norte.....	Wire cut, insulators broken.
Sept. 5	$\frac{1}{2}$ mile north of Badoc, province of Ilocos Norte.....	Slight.
Do...	1 mile north of Badoc, province of Ilocos Norte.....	Do.
Sept. 9	2 miles south of Cabugao, province of Ilocos Sur.....	600 yards wire gone.
Do...	North of Cabugao, province of Ilocos Sur.....	400 yards wire gone.
Sept. 11	2 miles south of Cabugao, province of Ilocos Sur.....	Wire gone, 5 poles down.
Sept. 13	South of Santa, province of Ilocos Sur.....	Cut at river, difficult to repair.
Sept. 14	Near Novaliches, province of Manila.....	Slight.
Sept. 15	Near San Mateo, province of Manila.....	Cut by bullets during skirmish.
Sept. 16	Near Novaliches, province of Manila.....	Spans 50 to 75 feet taken.
Do...	Near Polo, province of Bulacan.....	Few feet wire gone.
Do...	Between Malolos and Guiguinto, province of Bulacan.	$\frac{1}{2}$ mile wire gone.
Do...	Between Malolos and Calumpit, province of Bulacan.	Do.
Do...	2 miles south of Cabugao, province of Ilocos Sur....	$\frac{1}{2}$ mile wire gone, 15 poles down, 6 insulators and brackets broken.
Sept. 17	North and south of San Antonio, province of Nueva Ecija.	Slight.
Sept. 18	Near Novaliches, province of Manila.....	Do.
Sept. 20	North of Vigan, province of Ilocos Sur.....	Do.
Do...	24 miles south of Badoc, province of Ilocos Norte....	2 pole lengths wire gone.
Sept. 22	Between Santa Rosa and San Isidro, province of Nueva Ecija.	Slight.
Do...	1 mile south of Magsingal, province of Ilocos Sur...	3 pole lengths wire gone, poles down, insulators and brackets broken.
Do...	2 miles north of Magsingal, province of Ilocos Sur..	4 pole lengths wire gone, 4 poles down, insulators and brackets broken.
Do...	Between Baliuag and San Ildefonso, province of Bulacan.	$\frac{1}{2}$ mile wire and 10 poles gone.
Sept. 23	Between Subig and Castillejos, province of Zambales.	15 poles down, insulators broken, 1 mile wire gone.
Sept. 25	Near Paliuag, province of Zambales.....	Slight.
Sept. 26	South of Dinalupjan, province of Bataan.....	1 mile wire pulled in road.
Do...	Between Subig and Castillejos, province of Zambales.	Slight.
Sept. 27	Between Badoc and Batac, province of Ilocos Norte.	Do.
Sept. 28	Do.....	4 miles wire gone.
Do...	Near Badoc, province of Ilocos Norte.....	Slight.
Do...	Between San Ildefonso and San Miguel, province of Bulacan.	500 yards wire gone.
Sept. 29	Near BacI, province of Nueva Ecija.....	Slight.
Sept. 30	Between Santa Maria and Norzagaray, province of Bulacan.	Do.
Do...	Between Baliuag and San Ildefonso, province of Bulacan.	Do.
Do...	Near San Isidro, province of Nueva Ecija.....	Do.

In addition to the above, Lieutenant Duffy reports on the 23d and 25th that the lines were being cut near Badoc and Batac faster than they could be repaired. On the 29th he reports that line was cut in two places near Pasuquin during the week, also in several places between Badoc and Batac and south of Badoc in the previous week, a total of more than 5 miles being destroyed.

LINES CONSTRUCTED DURING THE MONTH.

Telephone lines from Badoc to Currimao, Candon to Beach, Vigan to Beach, and Malolos to Poambon.

OFFICES OPENED DURING THE MONTH.

Telegraph.—San Nicholas, province of Nueva Ecija; Alcala, province of Cagayan; Siniat, province of Ilocos Sur.

Telephone.—Candon Beach, province of Ilocos Sur; Vigan Beach, province of Ilocos Sur; Poambon, province of Bulacan.

Number of messages handled during the month, 116,688.

OCTOBER, 1900.

Lieut. B. O. Lenoir reports as having performed the following duties during the month:

"Signal officer, third district, Department Northern Luzon, included in which duties was the building of a telephone line from Alava to Rosario, 7 miles; telephone line from Dagupan to Magaldan, 4 miles. Substituted hard wood poles on line in place of bamboo poles from Dagupan to Magaldan, 4 miles. Procured hard wood poles for telegraph line from San Fabian to Santa Tomas, 15 miles. Procured hard wood poles for telegraph line from Lingayen to Sual, 12 miles. Spliced all of the river cables, which on account of deficiencies had been found useless and removed from river crossing. Two full reels of river cable had been used in five months in crossing two rivers, each of which is about 250 yards wide. The cable was copper armored, and its main deficiency was that between the armor and the insulation surrounding the conductor there was only one thickness of tape, which was not enough to deaden any blow the cable received, consequently, on the receipt of a blow, the insulation was affected and the cable leaked. One river has had placed therein the sea cable, and it is contemplated that a sea cable will soon be placed in the other river. During the month the insurgents have seriously interfered with the Signal Corps lines, but the repairs have been rapidly made."

Lieut. E. W. Binkley reports as follows:

"October 1, telephone line, Malolos-Poambon, broken by falling bamboo about 1½ miles from Malolos and promptly repaired. October 2 constructed telephone line from Quingua to Pulilan; distance, 2½ miles. October 4 repaired line from Meycauayan to Polo, extending same to Polo station, and installed telephone at each station. During the remainder of the month inspected over 2,000 telegraph poles; accepted 750."

Lieut. B. E. Grabo reports:

"October 1 went to Mahalacal to inspect poles for proposed Manila and Dagupan telegraph line; accepted none; rejected 500. October 2 tested single motor car on Manila and Dagupan Railroad, obtaining excellent results. October 10 inspected poles for proposed Manila and Dagupan telegraph line; accepted 93. October 12 to October 24 commanding Company F, Signal Corps, United States Army, for and in the absence of Capt. D. J. Carr."

Lieut. R. O. Rickard reports:

"During October but two absolute interruptions to the line working through, viz On the 3th, when the insurgents cut the line some 4 miles from Tumannini; one on the 28th by cross at Iligan River, loop span spread. Heavy rains for fourteen days of the month made work at times difficult, necessitating using Tuguegarao as second relay station. The adjutant-general this district receives daily wire reports as to working of line, in which he takes the greatest interest and aids in every way."

Lieut. C. M. Duffy reports:

"The extreme activity of the insurgents and the movement of detachments, thereby weakening garrisons, renders it a matter of difficulty to secure sufficient guard for linemen to remain for such work on the line in the way of permanent and general repairs. General Young gives me all the assistance possible and consistent."

Lieut. Magnus Nordquist reports as having been engaged during the month in the supervision of clearing the way for new telephone line along the Manila and Dagupan Railway.

The installation of the storage-battery system at Dagupan was completed on October 28 with entire success. The supervision of the technical work of wiring the battery and line's switch board, as well as the more important part of the work, was done by Lieut. Henry S. Hathaway, Company E, Signal Corps, United States Volunteers. He dismantled and remodeled the switch board sent here by the manufacturers, and he has established a plant which is a model and which reflects great credit upon him. To meet necessities in the case, the expert knowledge of First-class Sergeant Taylor, Company E, Signal Corps, United States Army, in the matter of mixing the acid solution for the storage battery and in connecting up the battery, was availed of, and his work was very creditably performed.

October 12 to 24 Capt. D. J. Carr was in Dagupan in connection with his duties as chief signal officer, Department Northern Luzon, and in general supervision of the installation of the storage-battery system.

Wires cut by the insurgents during the month as per the following tabulation:

Date.	Place of interruption.	Damage.
Oct. 2	Between San Quintin and Pidigan, province of Abra.	Wire and poles for 22 poles destroyed.
Do...	North San Isidro, province of Nueva Ecija.....	500 yards wire cut out.
Oct. 6	Near San Quintin, province of Abra	Slight.
Oct. 9	Near Iligan, province of Isabela.....	To considerable extent.
Oct. 10	Between Castillejos and Subig, province of Zambales.	Cut in two places.
Do...	Between Santa Rosa and San Isidro, province of Nueva Ecija.	Slight.
Do...	Near Badoc, province of Nueva Ecija	Do.
Do...	Near Aliaga, province of Nueva Ecija.....	Do.
Oct. 11	East San Jose, province of Nueva Ecija	Cut seven different places; 1½ miles gone; poles and insulators broken and destroyed.
Oct. 12	North Siniat, province of Ilocos Sur.....	200 yards wire gone.
Oct. 14	.....do.....	Slight.
Oct. 15	Between Paniqui and Moncada, province of Tarlac.	400 yards wire gone, 4 poles destroyed two-thirds mile wire and poles cut down.
Do...	Between Moncada and Bautista, province of Tarlac.	10 poles cut down, 4 carried away.
Do...	Between Paniqui and Cuyapo, province of Tarlac..	50 feet wire cut down.
Do...	North Badoc, province of Ilocos Norte.....	4 pole lengths wire gone, 3 insulators broken.
Oct. 16	Near Subig, province of Zambales.....	100 yards wire cut out.
Do...	North Cabanatuan, province of Nueva Ecija.....	Slight.
Oct. 17	Between Cabanatuan and Bongabong, province of Nueva Ecija.	Wire and poles taken away.
Do...	.....do.....	Slight.
Oct. 19	Between San Miguel and San Ildefonso, province of Bulacan.	100 yards wire carried away.
Oct. 21	Between San Quintin and Bangued, province of Abra.	2 miles removed—30 poles, insulators and brackets.
Oct. 23	5 miles north of Dinalupijan, province of Bataan...	Wire cut, one pole down.
Do...	Between Ballaug and San Ildefonso, province of Bulacan.	250 yards carried away, 2 poles and all insulators broken.
Oct. 28	Near San Domingo, province of Zambales.....	300 yards wire carried away.
Oct. 27	2 miles south of Pasuquin, province of Ilocos Norte	2,000 feet wire carried away.
Oct. 30	Between San Quintin and Pidigan, province of Abra	9 pole lengths wire taken.
Oct. 31	Between San Quintin and Bangued, province of Abra	Slight.

OFFICES ESTABLISHED DURING THE MONTH.

Telephone.—Pulilan, province of Bulacan; Rosario, province of Union; Bacolor prison, province of Pampanga; San Antonio, province of Nueva Ecija.

Telegraph.—San Quintin, province of Abra; Talavera, province of Nueva Ecija.

OFFICES CLOSED DURING THE MONTH.

Telegraph.—San Antonio, province of Nueva Ecija.

Number of messages handled during the month, 139,754.

NOVEMBER, 1900.

Lieutenant Lenoir reports the placing of repeaters in the Dagupan telegraph office, thereby giving through telegraphic communication between Manila and Vigan; the replacing of soft-wood poles and bamboo poles by hard-wood poles between Lingayen and Sual, a distance of 13 miles, and for 6 miles north of San Fabin; the construction of telephone line between Urdaneta and Villasis, 6 miles; the replacing of an ocean cable across the Agno River at San Isidro; building a combination telegraph and telephone line from San Fabin to Magaldan, 4 miles; general repairs of lines from Dagupan to Tayug and from Binalonan to Urdaneta, 40 miles.

Lieut. William Mitchell reports that the work on the section from San Fernando de Pambanga to Solano and from Cabanatuan to San Jose has been reconstruction and strengthening the lines. The section from Cabanatuan to San Isidro has been reconstructed, new poles being set where old ones showed signs of weakness. New span with 55-foot poles and line with 30-foot poles was put in between Cabanatuan and San Jose, where the water stands 20 feet deep during storms. New span was put in across Santor River near Bongabong. The construction of line (telephone) from San Isidro to Jaen. The reconstruction of the remaining distance from Cabanatuan to Talavera is now in progress. No interruptions in this section by the insurgents during the month.

Lieut. R. O. Rickard reports the general repairs of the lines in the province of Cagayan and Isabela, and the attack on repair party by insurgents on November 14, in which First-lieut. Sergeant Robin J. Todd, Company F, Signal Corps, United States Army, was killed, and the subsequent unsuccessful attempt to recover the body, which is supposed to have been thrown into the river by insurgents.

Lieut. C. M. Duffy reports the construction of a new telephone line from the Port of Vigan to Solomague, and from Batac to Paoy; also the general repairs in his district.

Lieut. N. P. Yurgensen reports the general repairs and supervision of lines in the province of Zambales.

Lieut. M. Nordquist reports the clearing away for new telegraph line along the Manila and Dagupan Railway; the reconstruction of one-half mile of line between Guiguinto and Malolos, cut down by the insurgents; the general supervision of the preparation of poles for the line along the railroad.

Lieut. B. E. Grabo reports the repairing of telephone line from Santa Ana to Apalit; the building of a line (telephone) from Manila to Sunken Road.

Lieut. E. W. Binkley has been engaged in the inspection of poles, the inspection of the Balanga line, and the installation of the phonoplex between Manila and San Fernando de Pampanga.

The lines have been cut by the insurgents during the month as per the following tabulation:

Date.	Place of Interruption.	Damage.
Nov. 4	Near San Quintin, province of Abra	350 yards wire cut out.
Nov. 5	Near Moncada, province of Tarlac	1 mile wire cut, 2 poles down.
Nov. 6	Near Subig, province of Zambales	Line cut in three places.
Do.	3 miles north of San Quintin, province of Abra	600 yards cut out.
Nov. 8	Between Guiguinto and Malolos, province of Bulacan	One-half mile wire and 4 poles destroyed.
Nov. 9	Between Gerona and Pura, province of Tarlac	Slight.
Do.	Near Magalang, province of Pampanga	Do.
Do.	Between Pura and San Juan de Guimba, province of Tarlac	700 feet wire missing.
Nov. 11	Between Castillejos and Subig, province of Zambales	Slight.
Nov. 12	Near Igilg, province of Cagayan	100 yards wire taken out.
Nov. 23	14 miles south of Dinalupjan, province of Bataan	75 yards wire taken out.
Nov. 29	Between San Quintin and Pidigan, province of Abra	One-half mile wire missing, 2 insulators broken.

This being a great falling off in interruptions of this kind.

The following offices opened during the month:

Telegraph.—San Esteban, province of Ilocos Sur; Eguia, province of Zambales; Santa Maria, province of Ilocos Sur.

Telephone.—District company's quarters, Dagupan, province of Pangasinan; district company's salesroom, Dagupan, province of Pangasinan; Gapan, province of Nueva Ecija; Penaranda, province of Nueva Ecija; San Nicholas, province of Nueva Ecija; Santo Domingo, province of Ilocos Sur; Lapog, province of Ilocos Sur; Solomague, province of Ilocos Sur; Cabaog, province of Ilocos Sur; San Fabian, province of Pangasinan; Paog, province of Ilocos Norte; Jaen, province of Nueva Ecija.

The following offices closed during the month:

Telegraph.—Gapan, province of Nueva Ecija; Penaranda, province of Nueva Ecija; San Nicolas, province of Nueva Ecija.

Number of messages handled during the month, 132,936.

DECEMBER, 1900.

Lieutenant Lenoir reports the general repairs of the line from San Fabian north and the line from Tayug to Dagupan, the construction of a telephone line from Dagupan to Calasiao, connecting at Calasiao with the line to Santa Barbara. Changed 4 telegraph stations to telephone—i. e., Dagupan Railroad depot, Calasiao, Magaldan, and San Fabian; rebuilt city lines in Dagupan, replacing old poles with new hard-wood poles, and built a loop to his quarters connecting with the Dagupan office; substituted hard-wood poles on lines from Capas to O'Donnell and Capas to Concepcion; built new telephone line in Dagupan, and improvised a telephone exchange from telephones, pending arrival of switchboard.

Lieut. William Mitchell reports the general repairs of the lines in the fourth district, department Northern Luzon.

Lieut. R. O. Rickard reports the general repairs of the lines in the provinces of Cagayan and Isabela. The swollen condition of the Cagayan River has rendered it very difficult to keep this line in repair and to have constant communication with Manila.

Lieutenant Duffy reports the installation of a telephone in the office of the depot quartermaster at Vigan, and the opening of a telegraph office at Pidigan, province of Abra, also general repairs on the lines in his district.

Lieutenant Yurgensen reports the general repairs and supervision of telegraph and telephone lines in the province of Zambales.

Lieutenant Nordquist, in charge of construction of line along the Manila and Dagupan Railroad, reports that about 10 miles of poles have been erected during the month, 2,700 poles painted, and 2,500 poles framed. On account of not being furnished with sufficient native labor, work is progressing very slowly.

Lieut. E. W. Binkley was engaged in the inspection of poles until December 16, 1900, when he was transferred to the transport *Burnside*.

The lines have been cut by the insurgents during the month, as per the following tabulation:

Date.	Place of Interruption.	Damage.
Dec. 2	Near Dinalupijan, province of Bataan	2 poles destroyed, 4 insulators broken, and 100 yards wire gone.
Dec. 16	Near Penaranda, province of Nueva Ecija	Slight.
Dec. 19	Near Santor, province of Nueva Ecija	Do.
Dec. 21	Morong and Tanay, province of Morong	1 mile wire missing.
Dec. 22	Near Batoc, province of Ilocos Norte.....	300 yards wire missing.

The following offices were opened during the month:

Telegraph.—Cauayan, province of Isabela; Pidigan, province of Abra; Santo Tomas, province of Union.

Telephone.—Depot quartermaster's office, Vigan, province of Ilocos Sur; Obando, province of Bulacan.

The following offices were closed during the month:

Telephone.—Urbistondo, province of Pangasinan; San Clemente, province of Tarlac; San Ignacio, province of Tarlac.

Telegraph.—San Fabian, province of Pangasinan; Calasiao, province of Pangasinan; Magallan, province of Pangasinan.

Number of messages handled during the month, 154,184.

JANUARY, 1901.

Lieutenant Lenoir reports general repairs throughout his district, as follows:

Inserted hard-wood poles between the following places: Capas to Concepcion, 6 miles; Capas to O'Donnell, 12 miles; Gerona to Pura, 14 miles; Pura to Victoria, 9 miles; Pura to San Juan de Guimba, 9 miles; Rabon to Santo Tomas, 5 miles; Tayug to San Nicholas, 3 miles.

Inserted 4 miles new wire in place of faulty wire north of San Fabian.

Installed telephone at Anao (new station).

Superimposed telephones on telegraph line at San Carlos, Malasiqui, and Alcala, using the type "D" kits and $\frac{1}{2}$ M. F. condensers at the two first-named stations and a service telephone at the latter. The condensers are protected by the Argus lightning arresters.

Lieutenant Rickard reports general repairs of all lines in the second district, Department Northern Luzon.

Lieutenant Duffy reports general repairs of all lines in the first district, Department Northern Luzon. The interruptions to communication during the month have been few.

Lieutenant Grabo reports general repairs of all lines in the fourth district, Department Northern Luzon.

Lieutenant Nordquist, on duty in charge of the construction of the telegraph line from Manila to Dagupan, reports that the three parties under his charge have erected 43 miles of poles, painted 1,200, and framed 1,600. Work has been delayed somewhat on account of the railroad company not being able to furnish transportation for poles when required.

Lieutenant Smith has been engaged in the inspection of poles and the payment for the same.

The lines have been cut by the insurgents during the month as per the following tabulation:

Date.	Place of Interruption.	Damage.
Jan. 1	Near Badoc, province of Ilocos Sur	Several poles destroyed.
Jan. 2	Near San Iddro, province of Nueva Ecija	1 mile wire carried away.
Jan. 3	Near Santa Cruz, province of Ilocos Sur	Slight.
Jan. 4	Near Reina Mercedes, province of Isabela	Do.
Jan. 8	Near Angadanan, province of Isabela	$\frac{1}{2}$ mile wire carried away.
Jan. 20	Near Gapan, province of Nueva Ecija	175 yards wire carried away.
Jan. 23	Between Santa Rosa and San Iddro, province of Nueva Ecija.	Slight.
Jan. 25	2 miles north Cabanatuan, province of Nueva Ecija.	$\frac{1}{2}$ mile wire carried away.

The following office opened during the month:

Telephone.—Anao, province of Tarlac.

The following offices closed during the month:

Telegraph.—San Esteban, province of Ilocos Sur.

Telephone.—Novaliches, province of Manila.

Number of messages handled during the month, 152,722.

FEBRUARY, 1901.

During the month about 100 miles of line has been repoled with hard-wood poles.

The following lines have been constructed in the department during the month:

Telephone line from a point between Villasis and Rosales to Santo Tomas, province of Nueva Ecija, distance about 2 miles.

Telephone line between Subig and Olongapo, province of Zambeles, completed, distance $8\frac{1}{2}$ miles.

Telephone line between Malabon and Caloocan has been rebuilt and telephone line between Meycauayan and Polo.

The main telegraph line between Manila and Dagupan has progressed nicely, 40 miles of poles having been set and 217 $\frac{1}{2}$ miles of main line wire strung.

Very few interruptions occurred during the month due to the action of the insurgents, and none of any consequence.

Telegraph instruments were taken out of offices at the following places and telephones installed: Alcala, province of Pangasinan; Santa Maria, province of Nueva Ecija; San Quintin, province of Nueva Ecija.

The following offices were opened during the month:

Telephone.—Magsingal, province of Ilocos Sur; Santo Tomas, province of Nueva Ecija.

The following offices were closed during the month:

Telegraph.—La Lomboy (convent), province of Bulacan; Calulut, province of Pampanga.

Telephone connection made between Sual, province of Pangasinan, and engineers' camp, 10 miles west, by superimposing buzzer on telegraph line.

Number of messages handled during the month, 145,689.

MARCH, 1901.

During the month about 90 miles of line has been repoled with hard-wood poles.

The following lines have been constructed in the department during the month:

Telegraph line from Trinidad to Banguio, province of Benguet; distance, 5 miles.

Telephone line from Digras to Solsona, province of Ilocos Norte; distance, $5\frac{1}{2}$ miles.

Telephone line from Namacpacan to Alilem, province of Union; distance, 13 miles.

Twenty-seven and one-half miles of poles were erected and 270 miles of wire strung on the main telegraph line between Manila and Dagupan. Offices cut in on the new line at the following stations: Angeles, Mabalacat, Bamban, Capas, Murcia, and Tarlac.

The strike on the Manila and Dagupan Railroad delayed work somewhat, as considerable trouble was experienced in getting material distributed.

The lines have been cut by the insurgents as per the following tabulation:

Date.	Place of Interruption.	Damage.
Mar. 1	Near Cedig, province of Abra	200 yards were carried away.
Mar. 9	Near Solano, province of Nueva Viscaya	Slight.
Do.	Near Cordon, province of Isabela	Do.
Mar. 11	Near Paoy and Batac, province of Ilocos Norte	25 feet carried away.

The following offices were opened during the month:

Telephone.—Engineer camp, between Bayambang and Camiling, province of Pangasinan; Subig Pass, province of Zambales.

Telegraph.—Santa Cruz, province of Ilocos Sur; Santiago, province of Ilocos Sur.

The following offices were closed during the month:

Telegraph.—Eguia, province of Zambales (temporarily).

Number of messages handled during the month, 148,020.

APRIL, 1901.

During the month about 50 miles of line has been reposed with hard wood poles.

The following lines have been constructed in the department during the month:

Telephone line from Bangued to San Juan, province of Abra; distance, 9½ miles.

Telephone line from Tayum to San Jose, province of Abra; distance, 19 miles.

Telephone line from Candon to Anaqui, province of Lepanto; distance, 32 miles.

Telephone line from Bacarra to Vintar, province of Ilocos Norte; distance, 5 miles.

Telephone line from Digras to Solsona, province of Ilocos Norte; distance, 6 miles, and from Dingras to Banna, province of Ilocos Norte; distance, 9 miles.

A telephone line is being constructed from Subig to Dinalupijan, province of Bataan, and is now nearly completed. While working on this line, Sergt. Charles H. Ziegler, Company F, Signal Corps, United States Army, accidentally shot himself, the bullet making a flesh wound in the thigh, necessitating his removal to the hospital at Dinalupijan.

The new telegraph line between Manila and Dagupan was completed on April 23, and is now working in first-class condition. Sergt. Carr Wilson, Company F, Signal Corps, United States Army, was severely injured by falling from a telegraph pole while working on this line near Calasiao, April 20, 1901. He was removed to the military hospital at Dagupan.

Interruptions of communication during the month were as follows:

Date.	Locality.	Damage.
Apr. 12	¼ mile north of Santo Tomas, province of Pampanga.	All wires burned in two; 5 poles had to be reset.
Apr. 18	2 miles north of San Jose, province of Abra.....	200 yards wire taken away; 3 insulators broken.
Apr. 19	Taytay, province of Morong	2 miles poles and wire destroyed by fire.

The following offices were opened during the month:

Telegraph.—Bagnotan, province of Union.

Telephone.—Bangar, province of Union; Banna, province of Ilocos Norte; Bucay, province of Abra; Pasuquin, province of Ilocos Norte; Solsona, province of Ilocos Norte; Salcedo, province of Ilocos Sur; San Jose, province of Abra; San Juan, province of Abra; Tayum, province of Abra; Vintar, province of Ilocos Norte; Alilem, province of Union.

The following offices were closed during the month:

Telegraph.—Santo Tomas, province of Pampanga; Subig Pass, province of Zambales.

Number of messages handled during the month, 147,087.

MAY, 1901.

During the month the company has been engaged in the maintenance and operation of the military telegraph lines in the Department of Northern Luzon.

All lines in the department are being reconstructed with a view to putting them in first-class condition for the rainy season.

The telephone line between Apalit and San Luis, province of Pampanga, has been abandoned.

The telegraph line between Olongapo and Subig, province of Zambales, distance 9 miles, has been completed.

A loop has been constructed from main telegraph line along the railroad at Caloocan to Malabon, a distance of 3½ miles, and telegraph office opened at Malabon, May 31, 1901.

The telephone line between Caloocan and Malabon has been reconstructed.

Very few interruptions to communication during the month, and none due to the action of the insurgents.

The following offices have been opened:

Telegraph.—Olongapo, province of Zambales; Malabon, province of Manila.

Telephone.—La Paz, province of Abra; Piddig, province of Ilocos Norte.

Number of messages handled during the month, 145,707.

JUNE, 1901.

The work of reconstruction of existing lines has been continued, and all lines in the department, with the exception of the one from Solano to Aparri, are in good condition. The Aparri line is over trails in a mountainous country and the work of reconstruction on same is necessarily slow, but every effort is being made to put same in first-class condition.

Very few interruptions during the month, and none due to the action of the insurgents.

The following offices have been opened:

Telegraph.—Bulacan, province of Bulacan.

Telephone.—Bocave and Bigaa, province of Bulacan; Santa Maria, province of Bulacan.

The following offices have been closed:

Telegraph.—Balincaguin, province of Zambales; Talavera, province of Nueva Ecija; Guiguinto, province of Bulacan.

Telephone.—Santa Rita, Lugao, and Sexmoan, province of Pampanga.

Number of messages handled during the month, 137,596; 13,640 of the messages handled were relayed.

The following is a comparison of the operations of the Signal Corps in this department for the fiscal years 1900 and 1901:

	1900.	1901.
Number of telegraph offices	86	104
Number of telephone offices	53	123
Miles of line	1,560	12,672
Number of messages handled	(2)	1,643,847
Average number messages per month	(2)	136,987

¹ Telegraph, 2,199; telephone, 473.

² No record.

There are 67 native linemen and laborers who are constantly employed, and in cases of emergency others are employed during the necessity for the same. The natives have shown themselves to be very attentive to their duties, and with constant practice many of them have become expert linemen.

The material used is No. 9 galvanized wire for telegraph lines, and Nos. 9 and 14, principally the latter, for telephone lines, attached to standard American glass insulators, supported mostly by hard-wood poles. The apparatus employed is of the most modern description and best types.

With very few exceptions the enlisted men are sober, industrious, intelligent, and enthusiastic concerning the success of the work to be done by the Signal Corps.

The officers are all a credit to the service.

The health is however not as good as could be desired, especially of operators. The long hours of their day's work and lack of exercise is telling on those who have been here over two years. A number of men are now on duty who are entitled to and should be allowed a rest of some kind, but under the existing circumstances their services can not be spared. In spite of this there are few complaints.

APPENDIX No. 11.

REPORT OF CAPT. BENJAMIN F. MONTGOMERY, SIGNAL CORPS, IN CHARGE OF TELEGRAPH AND CIPHER BUREAU AT THE WHITE HOUSE.

TELEGRAPH AND CIPHER BUREAU,
EXECUTIVE MANSION,
Washington, D. C., September 27, 1901.

SIR: I have the honor to submit the following report:

During the past year the telephone and telegraph systems have remained practically the same. To the 25 wires already in use have been added two double telegraph wires, with two sets of duplex instruments. This was found necessary in order

to have an exclusive wire for the safe transmission of the confidential cipher business between the Executive Office and the cable offices in New York. An extra wire was also needed for direct communication with the President, wherever he might be, while absent from the capital.

Arrangements are nearing completion for the installation of a telephone exchange in the White House, which will supplement the telephone service already in use. This will increase the working capacity of this branch of the office, and will undoubtedly prove useful and fully meet the rapidly growing demands of this particular department. It will consist of 3 separate trunk lines, with 17 miles of exterior lines, giving direct wires to the 8 Executive Departments, the Government Printing Office, and the Congressional Library; and also connect up the 7 new stations in the different parts of the Executive Mansion, all of which will be controlled by the switchboard in the central exchange of the telegraph and cipher bureau.

Some of the larger maps in use during the past year have been stored away for safe-keeping. The map of Cuba and adjacent waters, over which the movements of the American fleets and Cervera's squadron were followed during the late Spanish-American war, has been loaned to the Pan-American Exposition at Buffalo, with the accompanying flags. There has been put in position a new map of the world which will be used for marking the movements of the Army and the Navy, in the place of the several maps above referred to. This map was made by the Coast and Geodetic Survey, at the suggestion of the signal officer in charge, and reflects great credit upon Mr. Fowler, the chief draftsman, and his able corps of assistants. It is probably the best map of its kind extant, as well as one of the largest. It is 8 feet high and 20 feet long. Twelve colors are employed, each representing territory of one of the twelve principal colony-holding powers. Countries without possessions are represented each by one of four additional colors, as shown in the key of colors. The coloring of Egypt is a combination of the colors of Egypt and England, gradually shading off into the English color as more established English sovereignty is reached below Khartoum. Political boundaries are shown in a broken line where they are fairly well established; otherwise the limits of sovereignty are defined by color only. The ownership of the outlying islands can be ascertained by reference to the key of colors, except in the case of a few islands in the South Atlantic and Indian oceans, where ownership could not be placed.

Capitals, largest cities, and the cities of commercial importance were selected, as well as the principal coaling, docking, and repairing stations of the ports of the world and points of strategic importance.

The submarine cables are shown in red lines and the names of the principal termini are given; likewise the names of the principal places where foreign mails are regularly distributed.

The Trans-Siberian Railway, from St. Petersburg to Vladivostock and Port Arthur, is shown on account of its military importance—a full short line showing the work that has been completed and a broken line showing the work in progress. The principal railways in China, in progress or projected, are likewise shown in a broken line.

The spelling of geographic names is in accordance with the decisions of the Board on Geographic Names, except in cases where no decision has been rendered. In such cases the best maps and atlases were consulted.

On this map are placed the distinctive flags which stand for the Army and the Navy, the names of the commanders of the Army being borne on miniature United States flags. The cavalry, artillery, and infantry are represented by flags of their respective colors—namely, yellow, red, and white—giving the number of the regiment and letter of the troop, battery, or company; the ships of the Navy of every class, from a battle ship to a collier, are displayed by red, white, and blue flags, giving the name of the vessel, her class, and the number of guns she bears. The army transports are indicated by small blue and white flags, carrying the name and giving in figures the capacity for officers and men.

As the official reports are received by telegraph and mail, these flags are moved from time to time so that the President may be able to know at any moment, by a glance at the map, the whereabouts of every ship of the Navy and the position of each separate command of the Army.

The total number of messages handled during the past year was 53,400, three-fourths of which were of a confidential nature and in the different departmental cipher codes.

During the fiscal year just closed the telegraph and cipher bureau of the Executive Office has fully measured up to the high standard attained in the past, and met every requirement necessary to the prompt and safe dispatch of the important and confidential business intrusted to its personnel. While the volume of business in some particu-

lars has not been quite so large as in previous years, owing to the less active movements of the Army and Navy at home and abroad, it has been greatly augmented by reason of the increased work of every executive department, growing out of the new order of things, and the extended fields of commercial and Government enterprise. The cause for this can be readily appreciated when it is remembered that the telegraph and cipher bureau is the medium through which the Chief Executive receives all important information touching the vast interests of the Government and is the means and method by which he may the more quickly and rapidly communicate with his Cabinet officers, the Executive Departments, and the outside world.

Many striking illustrations of the value and the adaptability of this service to the needs of the hour in great emergencies were shown in the late war with Spain. Then the constitutional Commander in Chief of the Army and Navy became the actual Commander in Chief, and from his office in the Executive Mansion gave orders direct to his armies in the field and his commanders on the sea, and from them received hourly reports of their operations ashore and afloat.

While the tragedy at Buffalo was enacted subsequent to the close of the last fiscal year, the signal officer on duty with the late President hopes it will not be thought untimely or improper to refer in these supplementary paragraphs to the work during the sad hours of watching and waiting, from the afternoon of September 6, 1901, when the fatal shot was fired, till the closing scene on September 19, 1901, when the body of our beloved chief was consigned to the grave.

Within fifteen minutes after the late President was struck down by the assassin's bullet the signal officer in charge at the Executive Mansion had secured two direct and exclusive wires to Buffalo—one a telegraph wire and the other a long-distance telephone circuit—and had put the office in direct communication with the secretary to the President and those nearest to the distinguished sufferer. The terminus of the telephone wire was close beside the hospital, and from this source was first obtained the official details of the horrible crime. All during the afternoon the long-distance telephone connection was kept clear, and over this wire the news, from moment to moment, was received and freely and promptly communicated to the officials of the Government in Washington, the anxious relatives and friends of the late President, and the public. Immediately upon the removal of the late President from the hospital grounds to the Milburn residence a telegraph wire was placed in the latter building and there maintained, in good working order, from that moment, both day and night, until the body was taken away to start on its journey to the capital.

During this period there were sent and received 4,351 messages, including official dispatches, bulletins, and tidings of alternating hope and sorrow to the anxious world. It will ever be a source of pride and gratification to the officer in charge and the faithful assistants, who, without heed of time or personal comfort, that they were given the high honor and the great privilege to stand and serve with those who faithfully watched by the bedside of the dying President.

Perhaps it is well to state at this juncture that the telegraph and cipher bureau was the creation of the great mind of the late President William McKinley, and it is well known to his official advisers and intimate friends that he has often spoken with evident pride and satisfaction of this particular part of the Executive Office. On many occasions he has spoken to the signal officer in charge in complimentary terms of this bureau and often gave willing and cheerful testimony to what he termed in his annual message of 1898 as a service which "was invaluable to the Executive in directing the operations of the Army and Navy."

The Chief Signal Officer I am sure will not think it improper or in any manner a violation of the confidence reposed if I recite an incident to illustrate the late President's high regard for the work of the Signal Corps. The night before the late President left Canton, Ohio, for the trip to Buffalo he made request of the signal officer in Washington, over long-distance telephone, for certain data concerning the telegraph work of the Army during the late war. The result of that conversation is the following graceful tribute to the work of the Signal Corps of the Army in his last public utterance, and which I take the liberty to quote herewith:

"It took a special messenger of the Government, with every facility known at the time for rapid travel, nineteen days to go from the city of Washington to New Orleans with a message to General Jackson that the war with England had ceased and that a treaty of peace had been signed. How different now!

"We reached General Miles in Porto Rico by cable, and he was able, through the military telegraph, to stop his army on the firing line with the message that the United States and Spain had signed a protocol suspending hostilities. We knew almost instantly of the first shots fired at Santiago, and the subsequent surrender of the Spanish forces was known at Washington within less than an hour of its consummation. The first ship of Cervera's fleet had hardly emerged from that historic har-

bor when the fact was flashed to our capital, and the swift destruction that followed was announced immediately through the wonderful medium of telegraphy. So accustomed are we to safe and easy communication with distant lands that its temporary interruption, even in ordinary times, results in loss and inconvenience. We shall never forget the days of anxious waiting and awful suspense when no information was permitted to be sent from Peking, and the diplomatic representatives of the nations in China, cut off from all communication inside and outside of the walled capital, were surrounded by an angry and misguided mob that threatened their destruction, nor the joy that thrilled the world when a single message from the Government of the United States brought through our minister the first news of the safety of the besieged diplomats."

Very respectfully,

BENJ. F. MONTGOMERY,
Captain, Signal Corps, United States Army.

APPENDIX No. 12.

Officers of the Signal Corps, United States Army, as reorganized under act of Congress, approved February 2 1901.

Name and rank.	Stations and duties.	At present station since—
<i>Brigadier-General.</i>		
Adolphus W. Greely...	Inspecting Signal Corps stations and cables in the Philippines.	Sailed from San Francisco on transport Sheridan, June 1, 1901.
<i>Colonel.</i>		
Henry H. C. Dunwoody.	Washington, D. C.; in charge of Signal Office during absence of the Chief Signal Officer of the Army; under orders for duty as signal officer, Department of the East, Governor's Island, N. Y.; on duty in Cuba from Dec. 22, 1898, to May 24, 1901.	June, 1, 1901.
<i>Lieutenant-Colonel.</i>		
James Allen.....	Signal Officer, Division of the Philippines, Manila, P. I.; on duty in Cuba and Cuban waters from May 29 to July 21, 1898, and in Porto Rico from July 26 to Sept. 1, 1898.	Dec. 19, 1899.
<i>Majors.</i>		
Richard E. Thompson.	Office of Chief Signal Officer, Washington, D. C.; on duty in the Philippines from July 25, 1898, to Dec. 29, 1899.	Feb. 12, 1900.
George P. Scriven	Office of Chief Signal Officer, Washington, D. C.; property and disbursing officer of the Signal Corps since Aug. 10, 1901; on duty in the Philippines from Aug. 21 to Sept. 2, 1898; Nov. 23, 1899, to July 17, 1900, and Dec. 9, 1900, to May 22, 1901; in Cuba Feb. 6 to Aug. 5, 1899; in China Aug. 2 to Nov. 25, 1900.	June 27, 1901.
William A. Glassford ..	Signal officer, Department of California, San Francisco, Cal.; on duty in Porto Rico from July 31, 1898, to Jan. 22, 1901.	July 5, 1901.
Joseph E. Maxfield....	Commanding Signal Corps Post, Fort Myer, Va.; on duty in Cuba from June 22 to July 22, 1898, and Dec. 16, 1898, to Jan. 14, 1899; in the Philippines from June 26, 1899, to July 1, 1900.	Oct. 1, 1900.
<i>Captains.</i>		
Frank Greene	Signal officer, Department of the Columbia, Fort St. Michael, Alaska; on duty in Cuba from June 22 to Sept. 12, 1898.	Aug. 2, 1900.
Samuel Reber	Military secretary to the Lieutenant-General Commanding the Army, Washington, D. C.; on duty in Porto Rico July 25 to Sept. 13, 1898; in Cuba Jan. 6 to Oct. 1, 1899.	June 1, 1901.
George O. Squier	In charge of cables, Burnside, Manila, P. I.	Dec. 6, 1900.
Edgar Russel	Office of the Chief Signal Officer, Washington, D. C.; on duty in the Philippines Aug. 24, 1898, to Apr. 22, 1901.	May 31, 1901.
Edward B. Ives.....	On 3 months' sick leave from Philippine Islands; on duty in Porto Rico July 28 to Aug. 7, 1898; in Cuba June 12, 1899, to Aug. 25, 1900; in Philippines Oct. 29, 1900, to Aug. 1, 1901.	Arrived in United States Aug. 28, 1901.
Eugene O. Fochet	En route for duty in the Philippines.....	Sailed from San Francisco, Cal., Sept. 16, 1901.
Chas. McK. Saltzman..	On duty at the Signal Corps Post, Fort Myer, Va.; on duty in Cuba June 24 to July 6, 1898.	May 16, 1901.

Officers of the Signal Corps, United States Army, etc.—Continued.

Name and rank.	Stations and duties.	At present station since—
<i>Captains—Continued.</i>		
Benj. F. Montgomery	On duty at the Executive Mansion, Washington, D. C.	May 25, 1898.
Daniel J. Carr	Signal officer, Department of the Colorado, Denver, Colo.; on duty in Porto Rico Aug. 14, 1898, to Apr. 22, 1899; in Cuba May 12 to June 7, 1899; in the Philippines Aug. 12, 1899, to Dec. 1, 1900.	Feb. 25, 1901.
Carl F. Hartmann	Signal officer, Department of Southern Luzon, Manila, P. I., since Dec. 17, 1900; on duty in Cuba, Jan. 28, 1899, to May 4, 1900.	Nov. 29, 1900.
George C. Burnell	On duty in Alaska, Fort Lisicum (Valdez), Alaska; on duty in Cuba June 22 to Sept. 12, 1898, and Jan. 16 to April 12, 1899.	July 9, 1900.
Leonard D. Wildman	Signal officer, Department of the Visayas, Iloilo, P. I.; on duty in Cuba Dec. 14, 1898, to July 8, 1899.	Dec. 15, 1899.
Charles B. Hepburn	Under orders for duty as signal officer, Department of Dakota, St. Paul, Minn.; on duty in Porto Rico July 31 to Sept. 18, 1898; in Cuba Jan. 21, 1899, to July 12, 1901.	
Otto A. Newsmith	Signal officer, Department of Cuba, Habana, Cuba	May 17, 1901.
<i>First Lieutenants.</i>		
Walter L. Clarke	Property and disbursing officer, Signal Corps, in the Philippines, Manila, P. I.	June 26, 1899.
Basil O. Lenoir	Signal officer, Department of Northern Luzon, Manila, P. I., since Aug. 10, 1901; on duty in Porto Rico July 28, 1898, to June 29, 1899.	Aug. 21, 1899.
Charles B. Rogan, Jr.	On duty in the Philippines, Manila, P. I.; on duty in Cuba Jan. 10, 1899, to July 14, 1900.	Oct. 25, 1900.
William Mitchell	On duty in Alaska, Fort Egbert, Alaska; on duty in Cuba Dec. 18, 1898, to Aug. 11, 1899; in the Philippines Nov. 2, 1899, to June 9, 1901.	Under order of Sept. 25, 1901.
Richard O. Rickard	On duty in the Philippines, Manila, P. I.; on duty in Porto Rico Aug. 4 to Dec. 28, 1898; in Cuba Jan. 6 to July 19, 1899.	Oct. 27, 1899.
Frank E. Lyman, Jr.	On duty in the Philippines, Manila, P. I.; on duty in Cuba Jan. 10 to Oct. 26, 1899.	Jan. 2, 1900.
Henry W. Stamford	On duty in the Philippines, Manila, P. I.; on duty in Cuba Dec. 16, 1898, to Aug. 10, 1899; in Philippines Nov. 7, 1899, to June 26, 1900; in China Aug. 2, 1900, to May 27, 1901.	June 5, 1901.
Charles S. Wallace	On duty in the Philippines, Manila, P. I.; on duty in Cuba Jan. 18 to Sept. 16, 1899.	Dec. 15, 1899.
George S. Gibbs, Jr.	On duty in Alaska, Fort Gibbon, Alaska; on duty in Philippines Jan. 31, 1899, to Dec. 30, 1900.	July 6, 1901.
Mack K. Cunningham	On duty at the Signal Corps Post, Fort Myer, Va.; on duty in Philippines March 22, 1899, to July 1, 1900.	Oct. 6, 1900.
Alfred T. Clifton	On duty in the Philippines, Manila, P. I.; under orders to Fort McDowell, Cal.	Mar. 25, 1899.
Charles DeF. Chandler	On duty in the Philippines, Manila, P. I.; on duty in Cuba Jan. 28 to May 8, 1899.	Sept. 26, 1901.
Henry S. Hathaway	On duty in the Philippines, Manila, P. I.	June 30, 1900.
Otto B. Grimm	On duty in Alaska, Fort St. Michael, Alaska	Aug. 2, 1900.

APPENDIX No. 13.

List showing officers of the volunteer signal force in service during the year ending June 30, 1901.

Name and rank.	Remarks.
<i>Majors.</i>	
George P. Scriven	Volunteer commission vacated by acceptance of commission in Regular Army as major, Signal Corps, Apr. 1901.
William A. Glassford	Volunteer commission vacated by acceptance of commission in Regular Army as major, Signal Corps, Mar. 14, 1901.
Joseph E. Maxfield	Volunteer commission vacated by acceptance of commission in Regular Army as major, Signal Corps, Mar. 18, 1901.
Frank Greene	Honorably discharged as major and signal officer, United States Volunteers, June 30, 1901.
Edgar Russel	Honorably discharged as major and signal officer, United States Volunteers, June 30, 1901.
<i>Captains.</i>	
Edgar Russel	Promoted major and signal officer, United States Volunteers, Apr. 12, 1901.
Gustave W. S. Stevens	Honorably discharged as captain and signal officer, United States Volunteers, in compliance with Special Orders, No. 106, Adjutant-General's Office Washington, May 7, 1901.

List showing officers of the volunteer signal force in service during the year ending June 30, 1901—Continued.

Name and rank.	Remarks.
<i>Captains—Continued.</i>	
Edward B. Ives.....	Volunteer commission vacated by acceptance of commission in Regular Army as captain, Signal Corps, June 13, 1901.
George O. Squier.....	Honorably discharged as captain and signal officer, United States Volunteers, June 30, 1901.
Eugene O. Feché.....	Volunteer commission vacated by acceptance of commission in Regular Army as captain, Signal Corps, Apr. 25, 1901.
Benjamin F. Montgomery.....	Volunteer commission vacated by acceptance of commission in Regular Army as captain, Signal Corps, Apr. 24, 1901.
Charles B. Hepburn.....	Volunteer commission vacated by acceptance of commission in Regular Army as captain, Signal Corps, May 1, 1901.
Daniel J. Carr.....	Volunteer commission vacated by acceptance of commission in Regular Army as captain, Signal Corps, Apr. 29, 1901.
Carl F. Hartmann.....	Volunteer commission vacated by acceptance of commission in Regular Army as captain, Signal Corps, May 26, 1901.
<i>First Lieutenants.</i>	
Leonard D. Wildman.....	Volunteer commission vacated by acceptance of commission in Regular Army as captain, Signal Corps, May 9, 1901.
John J. Ryan.....	Honorably discharged as first lieutenant and signal officer, United States Volunteers, June 30, 1901.
Frank E. Lyman, Jr.....	Volunteer commission vacated by acceptance of commission in Regular Army as first lieutenant, May 27, 1901.
William M. Talbott.....	Honorably discharged as first lieutenant and signal officer, United States Volunteers, Aug. 31, 1900.
George C. Burnell.....	Volunteer commission vacated by acceptance of commission in Regular Army as captain, Signal Corps, June 24, 1901.
Walter L. Clarke.....	Volunteer commission vacated by acceptance of commission in Regular Army as first lieutenant, Signal Corps, May 9, 1901.
Basil O. Lenoir.....	Volunteer commission vacated by acceptance of commission in Regular Army as first lieutenant, Signal Corps, May 8, 1901.
William O. Bailey.....	Honorably discharged as first lieutenant and signal officer, United States Volunteers, June 30, 1901.
Charles B. Rogan, Jr.....	Volunteer commission vacated by acceptance of commission in Regular Army as first lieutenant, Signal Corps, May 8, 1901.
William Mitchell.....	Volunteer commission vacated by acceptance of commission in Regular Army as first lieutenant, Signal Corps, Apr. 26, 1901.
Richard O. Rickard.....	Volunteer commission vacated by acceptance of commission in Regular Army as first lieutenant, Signal Corps, May 26, 1901.
Henry W. Stamford.....	Volunteer commission vacated by acceptance of commission in Regular Army as first lieutenant, Signal Corps, Apr. 27, 1901.
Frederick M. Jones.....	Honorably discharged as first lieutenant and signal officer, United States Volunteers, June 30, 1901.
William E. Davies.....	Do.
Charles S. Wallace.....	Volunteer commission vacated by acceptance of commission in Regular Army as first lieutenant, Signal Corps, United States Army, May 24, 1901.
Victor Shepherd.....	Honorably discharged as first lieutenant and signal officer, United States Volunteers, June 30, 1901.
George S. Gibbs, Jr.....	Volunteer commission vacated by acceptance of commission in Regular Army as first lieutenant, Signal Corps, Apr. 29, 1901.
Mack K. Cunningham.....	Volunteer commission vacated by acceptance of commission in Regular Army as first lieutenant, Signal Corps, May 3, 1901.
Alfred T. Clifton.....	Volunteer commission vacated by acceptance of commission in Regular Army as first lieutenant, Signal Corps, May 26, 1901.
John C. Wessels.....	Honorably discharged as first lieutenant and signal officer, United States Volunteers, June 30, 1901.
<i>Second Lieutenants.</i>	
Charles M. Duffy.....	Honorably discharged as second lieutenant and signal officer, United States Volunteers, July 25, 1901.
Niels P. Yurgensen.....	Honorably discharged as second lieutenant and signal officer, United States Volunteers, June 30, 1901.
John Kennedy.....	Killed by accident, line of duty, near Gerona, Luzon, P. I., November 24, 1900.
Henry S. Hathaway.....	Volunteer commission vacated by acceptance of commission in Regular Army as first lieutenant, Signal Corps, May 9, 1901.
Peter Bartsch.....	Honorably discharged as second lieutenant and signal officer, United States Volunteers, June 30, 1901.
Magnus Nordquist.....	Do.
Burt E. Grabo.....	Do.
John T. Sayles.....	Honorably discharged as second lieutenant and signal officer, United States Volunteers, May 15, 1901.
Charles O. Hastings.....	Honorably discharged as second lieutenant and signal officer, United States Volunteers, June 30, 1901.
Clifton R. Berry.....	Honorably discharged as second lieutenant and signal officer, United States Volunteers, Feb. 28, 1901.
Rush P. Wheat.....	Honorably discharged as second lieutenant and signal officer, United States Volunteers, June 30, 1901.
Otto B. Grimm.....	Do.
Earle W. Binkley.....	Do.
Harry W. Capron.....	Do.
Joseph Smith.....	Do.

APPENDIX No. 14.

REPORT OF CAPT. EUGENE O. FICHET, SIGNAL CORPS, ON THE DISBURSEMENTS OF
SIGNAL CORPS APPROPRIATIONS AND ALLOTMENTS.

WAR DEPARTMENT, SIGNAL OFFICE,

Washington, June 30, 1901.

SIR: I have the honor to submit this my fourth annual and final report as disbursing and purchasing officer of the Signal Corps, United States Army.

INTRODUCTORY.

It may not be amiss, as a matter of historical interest, to give a résumé of the operations of the disbursing and purchasing branch of the Signal Corps from the time that I relieved Major Craig, Signal Corps, June 2, 1898, to the present time, when I expect soon to be relieved by Maj. George P. Scriven, Signal Corps.

Major Craig being invalided by long and faithful service, I was detailed under Special Orders, No. 128, Adjutant-General's Office, June 1, 1898, to relieve him of the duties of these dual offices—combining the duties of purchasing and disbursing.

Under ordinary circumstances the regular demands made by the conservative and well controlled needs necessary to supply regular posts in the United States could be very easily foreseen and quickly filled upon requisition; but at once came the extraordinary demands created by the Spanish war, involving many articles not heretofore asked for, the very source of manufacture or supply not being known. The situation was a critical one, the demands imperative, and calling for immediate attention.

The technical character of the Signal Corps necessarily implies a progressive feature, keeping pace with advanced ideas as well as their successful accomplishment, and the task to which I first devoted my earnest attention—that of finding the ultimate manufacturers or sellers of imperatively needed supplies—was no easy one.

The office at the time was badly handicapped by an insufficient clerical force, there being only two men who understood the nomenclature or identity of Signal Corps equipment, and although this force was added to, upon these two experienced clerks fell not only the duty of meeting the imperative demands of correct business, but also the education of the new clerks. I do not wish to omit from this report mention of the hard and efficient work done by Serjts. H. L. Boyce and Peter Bartsch, of the Signal Corps, in every direction where demands were made on them without regard to hours.

Owing to the limited demands made before the war upon manufacturers of expensive telegraphic and telephonic outfits, the principal purchasers being the Western Union and Postal telegraph companies, as well as the corporations controlling the ocean cable systems, there was no surplus of manufactured stock on hand, the orders of these companies having been placed far enough in advance to simply meet the question of supply and demand.

Ocean cable was needed, grappling machinery for raising and cutting the Spanish cable was an immediate necessity, telegraph instruments of all patterns and resistances were called for, telephones became an immediate necessity, thousands of miles of telegraph wire of different gauges and metals had to be procured, the old-fashioned field glasses having become obsolete and lacking, both in field and power, an improved substitute had to be provided. The Signal Corps, having had assigned to it the duty of building, maintaining, and operating both a telegraphic and telephonic service, had to be supplied with line materials, implements, and equipments, and this had to be done at once. The installation of cable systems required the purchase of delicate auxiliary instruments, which, in all cases, had to be manufactured, and in some instances devised as to details of construction and to special features of integral parts.

It was found that Voightlander & Sons, Brunswick, Germany, made a field glass of superior power and field with a fine lens. They were communicated with and glasses purchased from them. Following this came the Porro-prism glass with a feature of a different focal adjustment for each eye, and they were purchased from Bausch & Lomb, Rochester, N. Y., and for a time constituted the main source for issue. The case containing the lens constituted an important feature in this, and at first the aluminum case seemed to be the one desired, but as service determined its comparative usefulness, it was found that the material was too light and fragile for the rough use of the field. Warner & Swasey, of Cleveland, Ohio, then submitted a Porro-prism glass that seemed to be an improvement on the former ones, and this has been tried with satisfactory results.

As a result of development and progression a new type of all the glasses has been obtained, having been manufactured according to suggestions from this office. Where possible the lightness of aluminum has been utilized in the cases, a stronger metal being used in the bridging and supporting parts.

The same can be said as regards telescopes. The old-fashioned brass telescope not being satisfactory, the first improvement was in the purchase of a very superior telescope, which seems to have answered all ordinary purposes. Besides this a still finer one was procured with the Brasher erecting prisms attached.

The necessary funds having been furnished by allotment, the matter of supplies was at once taken up. The demands at that time came principally from Tampa, Key West, Jacksonville, and other points where our troops were being mobilized preparatory to the advance on Cuba. The manufacturing establishments of the country met the demands thus suddenly made upon them with a promptness which was limited only by a capacity the increase of which was an impossibility.

Washington Barracks and Camp Alger being not only rendezvous, but also schools of instruction for the new officers and men added to the Signal Corps by the demands of war, had to be liberally supplied with every article needed, not only for practical instruction, but also for immediate use. At Camp Alger a complete interpostal telephone system had to be installed, requiring a large amount of material. Telegraphic communication had to be provided for, which was done.

The different camps afterwards established throughout the country had to be provided in the same manner: Camp George H. Thomas, at Chickamauga Park; Camp Meade, Pa.; Camp Cuba Libre, Jacksonville, Fla.; Camp at Tampa, Fla.; Camp Poland, Knoxville, Tenn.; Camp Shipp, Anniston, Ala.; Camp Hamilton, Lexington, Ky.; Camp Wheeler, Huntsville, Ala.; Camp Wykoff, Montauk Point, New York, as well as other minor ones.

With the acquisition of Cuba, Porto Rico, and the Philippines, the demand for supplies became enormous as well as urgent and immediate.

At the beginning of the war the scope of the Washington or headquarters supply depot was enlarged, ultimately ending in a separate building, where a vast amount of supplies could be received and shipped. Branch depots were established in the Cheesebrough building, in New York City, and in San Francisco, and also one in Savannah, Ga., from which immediate demands could be supplied. As this will be handled more in detail hereafter, a mere reference to it is here made.

The opening of a large general hospital in Savannah called for the installation of an elaborate telephone system, which was furnished from my office. The demand for a hurried equipment at Camp Wykoff at Montauk Point, New York, called for another strenuous effort to meet the demand as far as the Signal Corps was concerned. This involved the furnishing and installation of an electric light plant, of a telephone system connecting the different important parts of the camp, of a telegraph line connecting with the Western Union, all of which involved a large amount of work, the details of which it may not be amiss to mention.

In the first place poles had to be provided for all three of the systems, the insulators, cross arms, linemen's tools and equipments, wire of different gauges, cleats for interior work, dynamos and engines, lamps, both incandescent and arc, telephones, telegraph instruments and tables, and numerous other things too many to mention.

But these camps merely constituted the home demand. Beyond this was the furnishing of supplies for Cuba, Porto Rico, and the Philippines, and to this must be added the ordinary home supplies for regular military posts and stations throughout the United States.

In Cuba, owing to the defective and obsolete character of the Spanish system of telegraph and telephone supplies, it became necessary to furnish and install entirely new systems equipped with the latest appliances, the same condition applying to Porto Rico as well as the Philippines. Not only was it necessary to furnish all technical instruments needed, but office furniture as well, and a complete supply of blanks for the purpose of transacting business in the American way. Many of the latter were in Spanish and English, the necessity for the use of the two languages being obvious.

Last year and during the present one it has become necessary to send to Alaska a complete outfit. Both Alaska and the Philippines have been furnished with a large amount of cable, from the smaller gauge of submarine to the larger deep-sea cable.

THE CABLE SHIPS.

At the beginning of the Spanish war it became necessary to fit out a vessel for the purpose of proceeding to Cuban waters and destroying cable communication between Havana and the outside world. For this purpose the *Adria* was procured and fitted

up as best it could be with the limited facilities on hand at that time, and placed in charge of Lieut. Col. James Allen, Signal Corps.

Later on, under your orders, the cable ship *Hooker* was thoroughly equipped for service in the Philippines. Water-tight cable tanks of large dimensions had to be built and strongly secured in position in the hold of this ship. These tanks were of boiler plate, built up and strongly riveted. In addition to the deep-sea and shore-end cables the *Hooker* carried a complete outfit of cable instruments and machinery for laying the same between the islands of the archipelago. Through the courteous cooperation of the Navy Department a complete deep-sea sounding equipment was supplied the *Hooker*. Unfortunately, the *Hooker* ran aground at Corregidor Reef, and made other arrangements necessary, which ultimately resulted in obtaining the *Burnside* from the Quartermaster's Department, when she, also, was furnished with a complete cable-laying outfit, and is now in Philippine waters doing efficient cable work.

THE SUPPLY-DEPOT SYSTEM.

The immense amount of work involved in furnishing these supplies made it necessary to increase and elaborate the supply system, both in material, personnel, and facilities. The Washington supply depot had added to its ordinary duties of keeping an accurate record of all receipts and shipments made at Washington, the duty of keeping records of all shipments from factories and warehouses direct to Porto Rico, Cuba, and the Philippines. The character of the war, being with a nation speaking a different tongue, made necessary the purchase of a large number of technical and linguistic books. These have been kept at this depot and supplied from here. Added to this has been the care necessary in packing safely the many different kinds of delicate instruments, as well as providing the requests for transportation and keeping records of same for tracing in case of delay or loss. A thorough system of marking and directing package has been adopted by which mistake as to destination is impossible, and each package having a serial number marked plainly thereon, identification has become an easy matter. At the request of the Chief Signal Officer, the Quartermaster-General has arranged for reports from the depot quartermasters at San Francisco, Cal., and New York City, showing the number of packages, how addressed, and the serial number of each package shipped on Government transport. This arrangement for checking shipments is proving of great value in tracing stores.

The wisdom of establishing auxiliary depots at New York and Savannah has been so plainly apparent that it needs only a mention here, as both of them, by having stock on hand, were able to make immediate shipments to both Cuba and Porto Rico, and the San Francisco depot proved especially valuable in filling emergency orders from the Philippines.

CURRENT FISCAL YEAR.

During the fiscal year ending June 30, 1901, this office has completed the equipment for Alaska, as well as furnished additional supplies for the Philippines, besides the annual supplies needed for military posts. This has called for a large number of telegraphic instruments as well as implements for line building, including poles, insulators, cross-arms, etc.

Additional cable has been furnished to Alaska and the Philippines, and Manila is now thoroughly equipped with a telephone system with a central switchboard as well as a military electric-light system. The disturbance in China having reached an end, the stores diverted from Manila to equip that expedition have been returned to their original destination, excepting the comparatively small number of articles necessary for use at the legation and for local purposes.

THE PHILIPPINES.

During the past fiscal year demands for supplies from the Philippines have been larger than during the preceding year, owing to the constantly increasing extent of territory covered by telephone and telegraph lines and also to the largely increased mileage of cable that has been laid. Added to the supplies necessary for the installation of new lines, a large amount of supplies has been required for the maintenance of the old lines. A list is appended showing the quantities of some of the chief articles sent to the Philippines during the fiscal year just closed.

While with each occupation of additional territory there will be some further demands for material, the general supply depot at Manila is now well furnished with signal equipment for the current fiscal year. A complete list is too elaborate to include in this report, as it would embrace many hundreds of articles.

CUBA AND PORTO RICO.

The fact that all lines of internal communication in Cuba and Porto Rico have been turned over to the insular civil governments will decrease the demand upon the Signal Corps. The supply of signal equipment for the garrisons of regular troops in these islands will constitute the only demands for the future upon the Signal Corps.

ALASKA.

The initial installation of a complete signal service in Alaska began last year and has called for the furnishing of a large amount of supplies, including submarine cable, and this demand will continue from year to year as the mileage of telegraph lines increases, after which the needs of maintenance only, including repair, will cause the demand to diminish.

UNITED STATES.

The continuous installation of interpostal telephone systems at the more important military posts has called for many supplies in this line.

MILITARY COLLEGES.

There is an increase of interest shown by the different military colleges in this country in signaling instruction, as is manifested by the increased number of requests for supplies. These consist almost altogether of requisitions for articles needed in visual day and night signaling, such as flags, lanterns, and heliographs.

To more fully set forth the scope and extent of Signal Corps operations, a detailed statement is attached showing totals of expenditures under the several appropriations from July 1, 1898, to June 30, 1901.

During the past fiscal year there were 1,607 packages shipped from the Washington supply depot, and for the majority, boxes were made by the carpenters attached thereto. The hours of work at this depot have been regulated only by the demand for hurry, and during the intense heat of last summer they were from 7 a. m. to 5 p. m.

The estimate of the clerical force required in the disbursing branch of the chief signal office for the coming fiscal year is respectfully submitted:

One principal clerk.....	\$1,600
One money-accounts clerk	1,400
Two clerks, who are also stenographers and typewriters, at \$1,200	2,400
Two clerks, at \$1,000 (1 property-returns clerk; 1 invoice clerk)	2,000
Total	7,400

This estimate provides for but two skilled accountants, viz, the money-accounts clerk and the property-returns clerk.

Two stenographers and typewriters are needed to meet the requirements of the vastly increased correspondence of this division. As typewriters these two clerks prepare all bids and specifications for the purchase under contract. The invoice clerk prepares all invoices and assists the property-returns clerk.

Under the above estimate the total cost of the administration of the disbursing office for the fiscal year ending June 30, 1902, is but \$7,400, and it is not believed that any reduction can be made without seriously crippling the efficiency of this office.

In conclusion I desire to earnestly bear testimony to the efficiency, intelligence, and loyalty to their work manifested at all times throughout the year by the clerical force under my charge.

These clerks are all on the temporary roll of the War Department, and by faithful work have earned some recognition. It is hoped that their transfer to the permanent rolls may be made.

In laying down the work and cares of the position of purchasing and disbursing officer, I wish to thank you for the cordial cooperation and aid which I have received at your hands. I can not but feel that those who have served under me have labored largely and intelligently with a single view of achieving quick dispatch of current public work.

Very respectfully,

EUGENE O. FECHT,
Captain and Signal Officer, United States Army, Disbursing Officer.

List of principal articles of Signal Corps property sent to Manila by Capt. E. O. Fechet, Disbursing Officer, during the fiscal year ending June 30, 1901.

Brackets.....	125,000
Blanks, telegraph.....	4,084,000
Cable, shore end.....miles.	37,008
Cable, deep sea.....do.	803,017
Cross arms.....	14,800
Insulators.....	196,555
Keys, telegraph.....	520
Poles, iron, complete.....	7,850
Telephones.....	557
Switchboards, telegraph.....	383
Switchboards, telephone.....	16
Wire, copper.....miles.	150
Wire, G. I.....do.	1,790
Wire, Silicon bronze.....do.	200

Disbursements U. S. Signal Corps, July 1, 1898, to June 30, 1901.

Appropriation.	Disbursed.	Turned in.	Cash on hand, July 1, 1901.	Cash in Treasury, July 1, 1901.	Total money handled.
1898-99.					
Signal Service of the Army, 1898.....	\$2,002.48				\$2,002.48
National defense.....	101,791.09				101,791.09
Signal Service of the Army:					
Jan. 1, 1899.....	324,617.15				324,617.15
1899.....	49,051.92				49,051.92
Military telegraph and cable lines, 1899.....	113,995.05				113,995.05
Year.....	621,457.69				621,457.69
1899-1900.					
National defense.....	378.33				378.33
Signal Service of the Army:					
Jan. 1, 1899.....	2,544.94	\$4,960.88			7,505.82
1899.....	3,008.31	380.21			3,388.52
1900.....	218,282.56				218,282.56
Military telegraph and cable lines:					
1900.....	14,690.77	1,179.39			15,870.16
Alaska, 1900-1901.....	23,809.80				23,809.80
Emergency fund, act Mar. 3, 1899.....	44,399.38				44,399.38
Year.....	307,114.09	6,520.48			313,634.57
1900-1901.					
Signal Service of the Army:					
1900.....	31,794.00			\$379.52	32,173.52
1901.....	391,217.50		\$52,458.18	75,000.00	518,675.68
Ordnance and fortification.....	16,321.46		7,303.19		23,624.65
Emergency fund, act Mar. 3, 1899.....	363,649.94		30.68		363,680.62
Military telegraph and cable lines, Alaska, 1900-1901.....	111,149.10		11,091.10	274,500.00	396,740.20
Year.....	914,132.00		70,883.45	349,879.52	1,334,894.97
Three years.....	1,842,703.78	6,520.48	70,883.45	349,879.52	2,269,987.23

APPENDIX No. 15.

REPORT OF CAPT. EDGAR RUSSEL, SIGNAL CORPS, IN CHARGE OF AUDITING DIVISION, SIGNAL OFFICE, WASHINGTON.

WAR DEPARTMENT, SIGNAL OFFICE,
Washington, July 1, 1901.

SIR: I have the honor to submit the following report of the work of examining division during the year ending June 30, 1901.

In addition to auditing the line receipts received as tolls at the various stations on military telegraph lines, there has been disbursed, mostly in small sums by 16 dis-

bursing officers, the sum of \$981,457.15, involving the examination of 201 accounts current and a large number of subvouchers.

Care has been taken to have all defects corrected as far as practicable before transmitting said accounts to the Treasury in order that there may be as few vouchers suspended as possible.

This phase of the work of this division has at all times been kept up to date.

During the continuance of the Spanish-American war, the examination of property returns was suspended. The old work has since been done, and all the returns of officers serving in the United States, Cuba, or Porto Rico for the period ending June 30, 1901, have been examined.

Owing to the great distance and the fact that the officers were engaged in active field operations, the property returns from the Philippine Islands have been received at irregular intervals, and long after the close of the period involved. This has necessarily caused the examination of said returns to proceed more slowly as one return not on file prevents the final examination of the returns of other officers.

This work has, however, been kept up as far as possible, and it is believed that the cessation of field operations and the establishment of an auditing department at Manila will soon remove all difficulties.

The bills of the Western Union Telegraph Company, the Postal Telegraph-Cable Company, and the Cuba-Submarine Telegraph Company have been examined and audited for each month as they are rendered.

Very respectfully,

E. RUSSEL,
Captain, Signal Corps, U. S. A.

APPENDIX No. 16.

REPORT OF CAPT. C. D. ROBERTS, SIGNAL OFFICER, DEPARTMENT OF TEXAS.

HEADQUARTERS DEPARTMENT OF TEXAS,
OFFICE OF OFFICER IN CHARGE OF
UNITED STATES MILITARY TELEGRAPH LINES,
San Antonio, Tex., July 11, 1901.

SIR: In compliance with paragraph 160, Regulations for the Operation and Maintenance of United States Military Telegraph Lines, I have the honor to submit the following report of the operation of United States military telegraph lines in the Department of Texas for the year ending June 30, 1901. Having relieved Captain Perry as signal officer of the department only a few days prior to rendering this report, the data herewith are as furnished me by that officer:

FORT BLISS—EL PASO SECTION.

This line is 6 miles long, connects Fort Bliss with the city of El Paso. At the outbreak of the Spanish-American war the line was transformed to telephone, but has been in operation again since April 16, 1901. The line is used only for the transmission of messages from the Western Union office at El Paso to Fort Bliss. A first-class private of the Signal Corps is the operator at the post. The line is in good condition. The total number of messages handled on line since resumption of business to June 30, 1901, was 40.

SPOFFORD JUNCTION—FORT CLARK SECTION.

This line is 9½ miles long, connecting Fort Clark with the Western Union system at Spofford Junction. This line is of great military and commercial benefit, as it is the only communication between Fort Clark, there being no telegraph office in the town of Brackettville, situated one-fourth mile from the post. The operator at Fort Clark is a first-class private of the Signal Corps. At Spofford Junction the railroad operator transfers all business. For his services he is paid \$10 per month by the Signal Corps. The line has been in operation during the entire year without interruption. Some repairs are needed, which will be made during the coming year. The total number of messages handled on this line from July 1, 1900, to June 30, 1901, was 1,161.

FORT M'INTOSH—FORT BROWN SECTION.

The line extends from Laredo (Fort McIntosh) to Brownsville (Fort Brown), following the Rio Grande, a distance of 209 miles, connecting with the Western Union Telegraph Company at the above-mentioned places. The battery of the line is

located partly at Laredo and at Brownsville, 75 cells at the former and 125 cells at the latter station. Offices are in operation at Laredo, Carrizo, Roma, Fort Ringgold, Edinburg, Santa Maria, and Brownsville. The Western Union Telegraph Company has free use of the line for its commercial business, and in consideration thereof supplies offices and operators at Laredo and Brownsville. This agreement was made between the Western Union Telegraph Company and the Chief Signal Officer of the Army, July 1, 1898, and has worked very satisfactorily. The operators and repairmen at Carrizo, Roma, Edinburg, and Santa Maria are civilians, paid by the Signal Corps. They furnish their offices and mounts required in keeping the line sections in repair. This arrangement has worked very satisfactorily.

At Fort Ringgold a sergeant of the Signal Corps is stationed, who is also chief operator of the line. The employees of the line have, without exception, given entire satisfaction.

The line was thoroughly overhauled and repaired during the year and is now in excellent condition. Repairs to the line were made as follows: At Laredo six 40-foot poles were replaced by new cedar poles over the railroad crossings and a few minor repairs made at a cost of \$85. At Carrizo the line was straightened and shortened by one-half mile, 11 poles recovered and brush cut out, at a cost of \$10. The entire line from Fort Ringgold to Brownsville, with the exception of 16 miles on the Santa Maria section, was rewired, numerous poles reset, brush along the line cut, etc., at a cost of \$337.50. The stringing of the 16 miles of wire on the Santa Maria is now being done at a cost of \$40.

Depredations on the line have not been so numerous as in former years, and the pernicious practice of the inhabitants of the Lower Rio Grande in shooting off insulators has been checked to a great extent through the efforts of the county sheriffs.

The most serious depredation reported during the year was the cutting of the wire on March 31, 1901, between two poles, 4 miles north of Fort Ringgold. About 200 yards of wire were carried off.

The total interruption on the line during the year was five days twelve hours and fifty-two minutes, due partly to the rewiring of the line.

The line is indispensable in the transaction of Government business, as it is the only communication between the garrisons at Forts Ringgold and Brown. In the transaction of commercial business the line has been of great benefit to the citizens of Rio Grande and Brownsville, and to settlers along the Rio Grande. Civil officers have often been aided in the apprehension of criminals so numerous along the border.

The personnel of the line is as follows:

PERSONNEL OF THE LINE.

ENLISTED MEN OF THE SIGNAL CORPS.

Sergt. Edward C. Bird, Signal Corps, operator at Fort Ringgold and chief operator of the line, assigned to duty as assistant to chief operator September 4, 1900. On duty as chief operator from October 6, 1900, to June 30, 1901. Left July 1, 1901, for duty at Denver, Colo.

First class Sergt. Charles F. Roberts, Signal Corps, reported at Fort Ringgold, Tex., June 18, 1901; relieved Sergeant Bird as operator at post and chief operator of the line June 30, 1901.

First class Private Emil Giesecke, Signal Corps, assigned to duty at Fort Ringgold, Tex., December 19, 1900, to receive practical instruction in the handling of commercial business.

CIVILIAN EMPLOYEES PAID BY THE SIGNAL CORPS.

John Lawrence, operator and repair man at Carrizo, Tex., \$55 per month.
J. R. Alania, operator and repair man at Edinburg, Tex., \$35 per month.
Alexander Champion, operator and repair man at Roma, Tex., \$30 per month.
A. G. Champion, operator and repair man at Santa Maria, Tex., \$30 per month.

CIVILIAN EMPLOYEES PAID BY WESTERN UNION TELEGRAPH COMPANY.

F. A. H. Sanborn, operator at Brownsville, Tex.
T. J. Bolleter, operator at Laredo, Tex.

The appended table exhibits the business transacted on the line during the fiscal year ending June 30, 1901.

Very respectfully,

C. D. ROBERTS,
Captain, Acting Judge-Advocate, Signal Officer.

Amount of cash receipts "This" and "Other" lines, value of free messages sent, number of commercial messages sent and received, and number of free messages sent and received on the Fort McIntosh-Fort Brown military telegraph line during the year ending June 30, 1901.

Stations.	Cash receipts "This line."	Cash receipts "Other line."	Value of free mes- sages sent.	Num- ber of com- mer- cial mes- sages sent.	Num- ber of com- mer- cial mes- sages re- ceived.	Num- ber of free mes- sages sent.	Num- ber of free mes- sages re- ceived.	Total num- ber of mes- sages hand- led.
Brownsville, Tex	\$172.68	.....	\$68.22	1,019	982	228	255	2,484
Laredo, Tex	266.89	.....	112.48	2,666	3,321	709	878	7,574
Fort Ringgold, Tex. a	661.23	\$433.23	156.91	3,204	2,736	612	500	7,052
Total.....	1,100.80	433.23	337.61	6,889	7,039	1,549	1,633	17,110

a With 4 substations, at Carrizo, Roma, Edinburg, and Santa Maria, Tex.

APPENDIX No. 17.

REPORT OF CAPT. A. B. DYER, ARTILLERY CORPS, SIGNAL OFFICER, DEPARTMENT OF CALIFORNIA, SUPPLEMENTED BY REPORT OF MAJ. W. A. GLASSFORD, SIGNAL CORPS.

SAN FRANCISCO, CAL., July 1, 1901.

SIR: I have the honor to submit the following report of the operation of the Signal Corps, United States Army, in the department for the year ending June 30, 1901.

For the fire-control system telephone lines were constructed extending the same from the 10-inch battery No. 9 to Fort Scott; to quarters of commanding officer, Fort Scott; to pneumatic battery; to mortar battery No. 12; and new wires were strung, in order to connect the following points with the central fire station: Twelve-inch guns Nos. 6, 7, and 8; 10-inch guns Nos. 10, 12, 14, 18, and 19; and mortar batteries Nos. 1 and 2.

The provisional camp (Model Camp) at the Presidio, for occupation by returning volunteer regiments, was provided with telephonic and telegraphic communication to department headquarters and all military posts in the harbor. At the United States general hospital, Presidio, a military telegraph office was established and placed on the circuit with military telegraph lines in the harbor and the main offices of the Western Union Telegraph Company in the city. The general-hospital telephone system was extended to the lower and upper corral of the Presidio. A local intercommunicating telephone system, with 18 stations, is under construction and nearing completion at the general hospital.

During a storm on November 21, 1900, the cable between Alcatraz Island and Angel Island was pulled out of the Angel Island cable box and carried into the bay by a dragging anchor of a French bark. Repairs were made by splicing 650 feet of new 3-conductor submarine cable.

The system of wireless telegraphy between Alcatraz Island and Fort Mason has been in working order during the entire year, with the exception of a few days when trouble was located in the ground connections.

The school of instruction for enlisted men of the Signal Corps is maintained at Fort McDowell, Cal., and as soon as competent the men are sent to Alaska and the Philippines.

Supplies for 100 miles of telegraph lines were purchased here and shipped for use in China, and other large quantities of supplies for Signal Corps have been purchased and shipped to Alaska and the Philippines. The transshipment of signal stores to above points from the East is carefully supervised.

Very respectfully,

A. B. DYER,
Captain, Artillery Corps, Signal Officer.

HEADQUARTERS DEPARTMENT OF CALIFORNIA,
OFFICE OF THE SIGNAL OFFICER,
San Francisco, Cal., August 1, 1901.

SIR: I have the honor to report upon the duties pertaining to the signal officer, Department of California, for July, 1901, with an additional résumé for the twelve months previous.

In compliance with Special Orders, 59, paragraph 27, Headquarters of the Army, Washington, March 13, 1901, I relieved Capt. A. B. Dyer, Artillery Corps, as announced in General Orders, No. 15, Headquarters Department of California, dated San Francisco, Cal., July 5, 1901.

The Department of California embraces the States of California and Nevada and the Hawaiian Islands; there are nine garrisoned posts and three camps, all except Camp McKinley being in California. Six of these posts are in the harbor of San Francisco, Benicia not far distant from them, while San Diego Barracks and its adjacent artillery post of Fort Rosecrans is the only distant one. The two camps in the State are at Sequoia and Yosemite National Park, at which a troop of cavalry is located, near Three Rivers and Wawana, respectively.

The Signal Corps is and has been practically only concerned with the department headquarters in the city and its connection with the five posts in the harbor, viz, Alcatraz Island, Fort McDowell, Fort Baker, Fort Mason, and the Presidio. Intercommunication is accomplished with these posts and headquarters in two ways, by telegraph and telephone. That by telegraph by a wire from headquarters, Phelan Building, through Fort Mason to Presidio, and thence to Forts Baker, McDowell, and Alcatraz Island over one of the strands of the three-conductor cable, taking the course as shown on the map accompanying. This circuit connects at department headquarters with a wire leading into the main office of the Western Union Telegraph Company for transmission of any messages. The Postal and the Sunset Telegraph companies have wires from their main offices to the signal office at headquarters.

The service by telephone is accomplished by a wire from department headquarters to Fort Mason and Presidio and thence over the second strand of the three-conductor cable to Fort Baker, Angel Island, and terminating at Alcatraz Island. In addition there is a telephone wire from headquarters to the City Central Telephone Exchange, and in consideration of the privilege of erecting poles on the Presidio and Fort Baker reservations and \$18 per month (paid by the Quartermaster's Department), the City Telephone Company gives unlimited switches to department headquarters, Fort Mason, and the Presidio, but not including the three posts connected by cable. From the Presidio a wire places Fort Winfield Scott and its adjacent batteries in telephonic communication with it.

The Signal Corps permits the quarantine officials at Angel Island the temporary use of the third strand of its cable between Angel Island (Fort McDowell) and the Presidio, at which latter point it connects with the city telephone system.

At the five points noted there are local exchanges and local telephones as follows:

	Exchanges.	Tele- phones.		Exchanges.	Tele- phones.
Fort Mason.....	1	4	Fort McDowell	1	4
Presidio	2	41	Alcatraz Island	1	8
Fort Baker	1	6			

With the exception of an extension on the fire-control system and the addition of some telephone lines at the Presidio, the system described has been in operation during the previous year.

The telegraph, telephone lines, and the wireless system in this harbor have been in uninterrupted working order during July, 1901. The intercommunicating system of 15 telephones at the United States general hospital, Presidio, was completed. The three remaining telephones of this kind on hand will be added to the system as soon as the buildings recently destroyed by fire are reconstructed.

The following material was expended on this work: Three miles of No. 14 G. I. wire; 12,620 feet of insulated copper wire, No. 19; 5 pounds tape; 420 porcelain insulators, with screws; 3 desk telephones, complete; 12 telephones, wall, complete.

This intercommunicating system of telephones gives perfect satisfaction, and all the commanding officers have expressed satisfaction with the systems established at their posts.

Besides the lines of telegraph, cable, and telephone, there have been erected lines for telephonic communication for fire control, but as the plans for general adoption have not been communicated nothing new has been done. Wires lead into all fortifications along the sea front of Presidio reservation to Fort Winfield Scott and connect with batteries near National Cemetery and Fort Mason. The lines for this purpose are in many cases constructed and little remains to be done as regards the posts in San Francisco Harbor.

In July, 1900, the two wireless stations of Fort Mason and Alcatraz Island were established and have been operated since. The operators now at these stations practice daily and are improving in its manipulation. With the return of Sergt. Peter Bartsch it is hoped to develop more. It could be used at present for a limited volume of communication. Attention is respectfully invited to the inclosed report pertaining to this system from Sergeant Peters.

The wireless instruments might be advantageously placed upon United States Army transports, this especially on vessels coming into this port, owing to the fog conditions that usually prevail at the Golden Gate. On my return here this matter will be taken up if approved.

At Fort McDowell during the year 213 men of the Signal Corps were rendezvoused—144 were sent to Manila, 44 to Alaska, and 25 returning convalescents from Manila were either assigned to stations in the United States or discharged the service.

Statement of amount of business transacted at military telegraph offices in San Francisco Harbor during fiscal year ending June 30, 1901.

Stations.	Cash receipts, "Other lines." ¹	Value free messages sent.	Number commercial messages sent.	Number commercial messages received.	Number free messages sent.	Number free messages received.	Total number messages handled.
Headquarters	\$180.00	\$803.40	975	.....	5,356	4,296	10,627
Fort Mason	60.00	45.00	150	100	300	350	900
Presidio	1,572.80	1,095.00	1,650	1,520	7,300	7,600	18,070
Fort Baker	20.00	42.00	80	75	280	360	795
Angel Island	124.00	352.50	200	175	2,350	2,780	5,505
Alcatraz Island	75.00	75.00	200	200	500	700	1,600
Total	2,031.80	2,412.90	3,255	2,070	16,086	16,086	37,497

¹ Operators in charge of telegraph offices settle in person with Western Union Telegraph Company for "Other line" cash receipts.

Statement July 31, 1901, of personnel.

Stations.	Number of men, Signal Corps.	Number of civilians.	Remarks.
Alcatraz Island	2	.....	Telegraph and wireless operators.
Fort Baker	1	.....	Operator.
Fort Mason	2	.....	Telegraph and wireless operators.
Fort McDowell	3	.....	Operator and 2 men awaiting assignment to foreign service.
Presidio .....	.....	2	Operators.
San Francisco	2	2	1 clerk, 1 on furlough, and 2 operators.
General hospital, Presidio	4	.....	Convalescents from Manila.

Very respectfully,

W. A. GLASSFORD,
Major, Signal Corps, United States Army.

STATION OF WIRELESS TELEGRAPHY,
Alcatraz Island, Cal., July 15, 1901.

SIR: I have the honor to submit herewith a report in connection with the system of wireless telegraphy established in the harbor of San Francisco, Cal., with stations on Alcatraz Island and Fort Mason.

Viewing the present system of wireless telegraphy as one yet in the experimental stage, I have the honor, in addition to making a general report, to offer such criticism and recommendations as the present development of the system has suggested to my mind.

I am pleased to report that the stations in operation in this harbor have been working uniformly and satisfactorily each day, thus proving that so far as the transmission of messages is concerned the system is an absolute success. Messages thus sent are received with remarkable distinctness, and the instruments throughout behaving in such a manner as to require no further attention than an occasional adjustment or a recharging of the batteries.

I find the wireless fully as reliable as the wire lines; not as satisfactory, however, for the reason that in its present stage of development it lacks speed as compared with lines, the system now in operation here being capable of dispatching but 15 words per minute accurately. No trouble is experienced in handling that number of words either in sending or receiving. When sending at this rate of speed the signals are perfect, but when a greater speed is attempted the signals become more or less inaccurate and some of the messages become a matter of guesswork.

With this degree of accuracy obtained, I feel disposed to say that the wireless telegraphy is a success for general use (without taking into consideration its possibilities through future improvement and development), as follows: First, as a means of communication between harbor stations and vessels about the harbor, particularly in a dense fog; second, for transmitting messages between the ships of a blockading fleet, but not for a fleet in action; third, for establishing communication rapidly and economically between the individual islands of a group; fourth, for maintaining communication between points in an icebound country, where, owing to heavy sleets and snow, a line could not be kept in repair; fifth, as a means of communication between forts or fleets and submarine boats while submerged.

In addition to the general uses of the wireless telegraph (in which our confidence is justified by its present degree of perfection) there are of course many other conditions under which it could be used, but in nearly every case it would merely intrude upon a field that could be easily covered by telephone or telegraph lines, and I am not inclined, at present, to believe that the wireless telegraphy would be acceptable in a field that could readily be covered by permanent land lines or cable, but must be limited in use to places where lines can not be readily constructed or maintained, or where the positions of stations are being constantly changed through the necessities of war, commerce, or the elements.

In connection with the wireless telegraph the following defects have come under my observation: First, the apparatus to my mind requires condensing and simplifying; second, a lack of speed as compared with land lines; third, the inability of an operator to break or interrupt another; fourth, the lack of secrecy in regard to matter being handled; fifth, the impossibility of operating more than one set of instruments in an office; sixth, the impossibility of operating more than one system within the limits of its range.

The first three (in the absence of experiments proving the contrary) seem entirely within our ability to overcome.

The fourth fault is that we can not prevent our system being tapped except by the adoption of a secret code.

The fifth and sixth objections, as far as I can see, must remain with us unless our knowledge of syntonizing arrangements be advanced materially.

In referring especially to the second objection, there seems to be no limit in sending—the speed is lost in the receiving instrument. This I believe can be overcome by improving the instruments and by the adoption of a code consisting entirely of dots, to be received on registers or ordinary sounders. In this direction I have given the Myer code considerable attention, but I find it faulty for the reason that many of the numerals in that code are repetitions of the letters, and it makes no provision for punctuation marks, which would be absolutely indispensable in the dispatching of messages by sound. To overcome this defect I have arranged a special code, consisting entirely of dots and spaces, which include the alphabet, numerals, and marks, at the same time reducing the volume of the Myer code in the alphabet from 126 dots and 55 spaces to 108 dots and 31 spaces, and making the punctuation marks much more simple than in either the Morse or Continental codes. I will gladly submit a comparison of the several codes should a more simple code be deemed worthy of consideration at this time.

I can not conclude my report without referring to the great need of properly equipped shops for the manufacture and remodeling of our apparatus, on lines that we feel justified in undertaking and for conducting further improvements.

Very respectfully,

FRANK E. PETERS,
First-Class Sergeant, Signal Corps, United States Army.

APPENDIX No. 18.

REPORT OF CAPT. LEROY S. LYON, ARTILLERY CORPS, SIGNAL OFFICER, DEPARTMENT OF THE EAST.

HEADQUARTERS DEPARTMENT OF THE EAST,
OFFICE OF THE SIGNAL OFFICER,
Governors Island, New York City, June 30, 1901.

SIR: In compliance with instructions in your letter of July 13, I have the honor to submit the following report for the year ending June 30, 1901.

Capt. Samuel Reber, Signal Corps, acted as signal officer of the department until May 23, 1901, when he was relieved by the undersigned.

INSTRUCTION IN SIGNALING.

Paragraph 1741, Army Regulations, contemplates, in the line of the Army, a qualification of at least 2 officers and 2 enlisted men in each independent command. Of the 45 garrisoned posts, 6 have failed to submit the annual report required by regulations, 30 report the required number of qualified enlisted men, 9 a deficiency. Of the 22 subposts, 2 report the required number of qualified signalmen.

The following gives a summary of the results of instruction during the year:

	Officers.	Men.
Number under instruction.....	35	425
Proficient in signaling.....	35	300
Proficient in telegraphy (15 words per minute).....	8	35

Percentage of qualified officers and men under instruction, 73.

Instruction has been made difficult by the many changes in the personnel of the garrisons during the past year.

With respect to instruction in telegraphy, I am of the opinion that past efforts to instruct enlisted men, without previous knowledge of the work of an operator, has not been altogether satisfactory, and that the time so expended would have given better results had it been employed in giving these men instruction in day and night signaling. An inexperienced telegraph operator is worse than none, and the average enlisted man has neither time nor opportunity to acquire the skill and speed required of a practical operator. I would therefore recommend that only men who were operators before enlistment be continued at that work. Table 1, hereto appended, gives a summary of the signaling work throughout the department during the year.

COMMUNICATIONS.

A list of the means of communication in and between posts and outside points is given in columns 7, 8, and 9 of this table.

CABLES.

The cable between Fort Wood and Ellis Island, New York Harbor, having been twice broken, the effort to maintain cable communication between those points has been abandoned. Specifications for a new cable between Forts St. Philip and Jackson have been submitted, and a contract let for its manufacture. Cable communication between Forts Gaines and Morgan and between Sullivan's Island and Fort Sumter has been recommended. Plans for connecting the fortifications on Great Gull and Plum islands and at Gardiners Point, at the eastern entrance of Long Island Sound, with the mainland at New London light, were submitted by my predecessor, Captain Reber. What action has been taken is not known.

The cable between Forts Delaware and DuPont, though not interrupted, gives poor service. Orders to test and repair it were requested on June 26. The cable between Forts Hancock and Wadsworth, recently broken, has been repaired and communication established, and specifications for 1,900 feet of new cable have been submitted for the repair of the existing break between Forts Wadsworth and Hamilton. During the past year a 4,000-foot 8-conductor cable was laid between the barge office, New York City, and Governors Island, New York.

RECOMMENDATION.

All fortifications comprising a fire command should be connected by cable or other means. This work should be undertaken as soon as the units of a single command have been definitely designated in each artillery district.

The numerous accidents to the cables in the crowded harbors of our large cities suggest the necessity for more heavily armoring, or possible trenching, the cables if this means of communication is to be efficiently and economically maintained. Since the progress of the development of wireless telegraphy does not seem to have yet reached a point which would warrant its adoption as a means of communication, even at short distances, it would seem advisable to conduct a series of experiments, under competent experts, with a view to thoroughly testing and developing the wireless system for communication in such harbors as New York and Boston.

TELEPHONE SYSTEMS.

The present methods of installing and maintaining the post and interpost telephone systems are not altogether satisfactory. At the majority of the posts in the department the system has been installed and maintained by men with no special experience with telephones. In many cases the result has been a useless expenditure of material and inefficient service. At artillery posts much of the difficulty in maintaining the service has been caused by the use of aerial lines. In view of the above facts, I would recommend the complete remodeling of the post telephone exchange by the adoption and installation of a standard 10-drop switch board at the administration building and the adoption of a standard telephone to be located in each of the following buildings: The guardhouse, the administration building, the quartermaster's office, the quartermaster's corral or stables, post hospital, company commanders' offices and quarters, post commander and post surgeon quarters, and only in such other buildings as may be required by the local conditions for proper post administration. In addition to the above telephones, a different type must be supplied during the next two years, at least, for the service of fire direction and control. At least four of these special type of telephones should be furnished each fully equipped heavy battery. The new telephone systems for post service and fire control above recommended should be planned and installed by an expert selected by the Chief Signal Officer of the Army. In each artillery district a specially selected electrician sergeant should be detailed to make a monthly inspection and keep in repair all the telephone systems at the several posts of the district. In cavalry and infantry garrisons this detail should be made from the Signal Corps. Circuits should be all metallic. Wiring for both post and fire-control service should be underground at all artillery posts.

SUPPLIES.

Under the present law and regulations the numerous classes of electrical supplies and equipment for an artillery post are drawn from three sources—the Signal Corps, Engineer Department, and the Quartermaster's Department. It would, I think, greatly expedite and simplify the system if the three departments above mentioned supplied a central artillery depot, to the commanding officer of which requisitions could be sent through the usual administrative channels.

SPECIAL DUTIES.

In addition to the strictly departmental work, much of the business connected with the electrical supplies for Cuba, Porto Rico, and the Philippines passes through this office. During the past month a new acetylene flash lantern has been tested, and the report thereon approved by the Acting Chief Signal Officer of the Army. This lamp is much superior to the old model made by the same company.

On July 19, 1901, the acting signal officer of this department was directed to cooperate with the board on electrical equipment for fire control, convened by paragraph 17, Special Order 136, Adjutant-General's Office, 1901. Although this board has already tested several types of apparatus for electrical communication, none have as yet been officially adopted. Experiments are now being conducted at Sandy Hook and Fort Wadsworth.

Very respectfully,

LE ROY S. LYON,
Captain, Artillery Corps, Acting Signal Officer.

APPENDIX No. 19.

REPORT OF CAPT. DANIEL J. CARR, SIGNAL CORPS, SIGNAL OFFICER DEPARTMENT OF THE COLORADO.

HEADQUARTERS DEPARTMENT OF THE COLORADO,
OFFICE OF THE SIGNAL OFFICER,
Denver, Colo., July 17, 1901.

SIR: I have the honor to submit the following report of this office for the fiscal year ending June 30, 1901. During the year the following officers acted as signal officers of the department: Capt. John B. Bennet, United States Infantry, was succeeded November 5, 1900, by Capt. Charles A. Varnum, Seventh Cavalry. The latter was relieved by Lieut. C. McK. Saltzman, Ninth Cavalry, per General Order No. 29, Department of the Colorado, November 19, 1900. Capt. D. J. Carr, Signal Corps, was announced as signal officer of the department in General Order No. 5, Department of the Colorado, February 26, 1901, and assumed the duties March 1, 1901.

MILITARY SIGNALING.

Owing to the few officers and enlisted men in this department during the year, little if any practice in visual signaling was had.

MILITARY TELEGRAPH LINES.

At the close of the year there are in operation six sections of military telegraph lines, one branch telegraph, and one telephone line, aggregating 516½ miles, as follows:

HOLBROOK-WILCOX SECTION.

This section is 268 miles long, it extends from Holbrook, Ariz., on the Southern Pacific Railway; at San Carlos, 105 miles north of Willcox, Ariz., it connects with the Gila Valley, Globe, and Northern Railway wire.

General repair parties from Forts Grant and Apache, Ariz., gave this section a thorough overhauling during the year. It is now in fair working order.

HELLNERS-MAMMOTH BRANCH.

This branch of the Holbrook-Willcox section connecting Mammoth, Ariz., with the commercial telegraph lines of the country is 34 miles long and is operated by a repeater at Hellner's ranch, 56 miles north of Willcox.

PRICE-FORT DUCHESNE SECTION.

This section is 87 miles in length and extends from Price, Utah, on the Rio Grande Western Railway, to Fort Duchesne, Utah. It affords telegraphic communication with Fort Duchesne as well as with the Indian agencies now there. This line is operated both as a telegraph and telephone line, telephones being located at Duchesne Bridge, the Wells, and Lee's ranch, and also at the terminals, Fort Duchesne, Utah, and Price, Utah.

BISBEE-SAN BERNARDINO SECTION.

This section is 42 miles in length; it extends from Bisbee, on the Arizona South-eastern Railway, to San Bernardino, Ariz.

On July 1, 1899, when the detachment of troops was removed from San Bernardino, the services of a telegraph operator at Bisbee were no longer required and the military telegraph office was closed.

The Chief Signal Officer of the Army authorizing, an agreement was entered into with the Bisbee Improvement Company on March 1, 1901, by which the company agreed to operate this line, keep it in repair at its expense, and furnish free service for official business of the different departments of the United States and their agents between Bisbee, San Bernardino, and Naco, Ariz. This agreement may be terminated by either party upon written notice of thirty days.

FORT HUACHUCA-HUACHUCA SECTION.

This line is owned by the Western Union Telegraph Company. It was leased from that company without cost to the United States and is operated telegraphically. It is 7 miles in length and connects Fort Huachuca with Huachuca Siding. Telegraphic communication was discontinued on June 23, 1899, owing to the fact that no Signal Corps men were available as operators. This line was telephonically operated after

the above date. As the service was unsatisfactory it was discontinued about October 20, 1899. From that date until April 29, 1901, the post was without means of electrical communication. On request of the commanding general of the department, telegraphic communication was reestablished April 29, 1901.

FORT BAYARD-SILVER CITY TELEPHONE LINE.

This line is 13 miles in length and connects Fort Bayard with the Commercial Telegraph system at Silver City, N. Mex., and Bayard, N. Mex. It was telegraphically operated until January 1, 1900, when it was changed to a telephone line owing to the scarcity of Signal Corps men for duty in the United States. A civilian is employed as transfer operator at Silver City. The operator at Bayard Station receives no compensation. The telephones have thus far given general satisfaction. There is also a telephone line, 2½ miles long, from Fort Bayard to Bayard Station, the shipping point for the post.

FORT WINGATE-WINGATE STATION SECTION.

This line is 3 miles long. It connects Fort Wingate with Wingate Station, on the Santa Fe Railroad.

FORT YATES-BISMARCK SECTION.

This line connects Fort Yates, N. Dak., with Bismarck, 60 miles from the post. It has been operated continuously during the year. It is in good repair.

MONEY STATEMENTS.

Nine hundred and twenty-two dollars and two cents was collected on the military telegraph lines under charge of this office during the year, and was duly covered into the United States Treasury.

Two thousand six hundred and eight dollars and forty-four cents was collected at various telegraph offices on account of messages destined to points on commercial lines, and was turned over to proper officers of the commercial companies.

The number of free messages handled was 12,837, of a money value of \$1,323.46.

A tabulated statement of the business transacted at each office is given in Table No. 2, hereto attached.

There has been a decrease in the receipts both for "This" and "Other" lines during the year, caused by the loss of tolls for messages from and to Globe, Ariz. The Gila Valley, Globe and Northern Railway built a telegraph line from Bowie Station, Ariz., to San Carlos, and connected there with the line of the Globe and San Carlos, thus diverting the business from the military lines.

Very respectfully,

D. J. CARR,
Captain, Signal Corps, United States Army,
Department Signal Officer.

TABLE 1.—Military telegraph lines in charge of the signal officer, Department of the Colorado, June 30, 1901.

Stations and sections.	Miles.	Stations and sections.	Miles.
Hillbrook-Willcox section:		Fort Bayard-Silver City section:	
Holbrook.....	0	Silver City (telephone).....	0
Snowflake.....	32	Fort Bayard (telephone).....	12
Cooley's ranch.....	66	Bayard station.....	24
Fort Apache.....	92	Huachuca siding-Fort Huachuca section:	
San Carlos.....	163	Huachuca siding.....	0
Hellner's ranch.....	212	Fort Huachuca.....	7
Fort Grant.....	237	Bisbee-San Bernardino section:	
Willcox.....	268	Bisbee (telephone).....	0
Hellner's Mammoth section:		United States custom-house (telephone).....	9
Hellner's ranch.....	0	San Bernardino (telephone).....	42
Table Mountain.....	24	Fort Wingate-Wingate station section.	
Mammoth.....	34	Fort Wingate.....	0
Price-Fort Duchesne section:		Wingate station.....	3
Fort Duchesne.....	0	Fort Yates-Bismarck section:	
Duchesne bridge (telephone).....	12	Bismarck.....	0
The Wells (telephone).....	26	Cannon Ball.....	41
Lee's ranch (telephone).....	50	Fort Yates.....	65
Price.....	87		

TABLE 2.—Statement of amount of cash receipts "This" and "Other" lines, value of free messages sent, number of commercial messages, etc., at each station on the United States military telegraph lines in charge of the signal officer, Department of the Colorado, during the year ending June 30, 1901.

Stations.	Cash receipts, "This line."	Cash receipts, "Other lines."	Value of free messages sent.	Number of commercial messages sent.	Number of commercial messages received.	Number of free messages sent.	Number of free messages received.	Total number of messages handled.
Bismarck, N. Dak.	\$91.78		\$118.96	604	669	735	781	2,789
Cooley's ranch, Ariz.	8.86	\$16.78	58.96	70	50	233	153	506
Fort Apache, Ariz.	39.50	280.66	259.14	634	510	1,073	801	3,048
Fort Bayard, N. Mex.				326	284	742	342	1,694
Fort Duchesne, Utah.	198.74	649.97	177.92	1,709	1,344	543	476	4,072
Fort Grant, Ariz.	14.77	406.78	309.93	714	693	1,340	69	2,816
Fort Huachuca, Ariz. ²	.74	21.78	4.39	31	23	28	19	101
Fort Yates, N. Dak.	65.00	333.28	85.97	861	632	585	550	2,637
Hellner's ranch, Ariz.	4.90	9.12	5.65	30	22	47	33	132
Holbrook, Ariz. ³	134.75	127.86	105.18	1,392	1,456	360	363	3,571
Huachuca siding, Ariz. ²	1.26		4.39	23	31	19	28	101
Mammoth, Ariz.	21.13	185.14		104	142			246
Price, Utah	189.59	259.44	86.77	1,344	1,709	476	543	4,072
San Carlos, Ariz.	63.61	274.33	71.15	277	582	172	44	1,075
Silver City, N. Mex. ¹				284	326	342	742	1,694
Table Mountain, Ariz.	5.13	12.69	.45	29	24	3	1	57
Willcox, Ariz.	84.26	30.61	127.81	611	523	581	604	2,319
Total.....	922.02	2,608.44	1,416.67	9,043	9,050	7,279	5,558	30,930

¹ Telephone line. ² Telegraphic communication reestablished April 29, 1901. ³ With one substation.

TABLE 4.—Number and kind of battery cells in use, etc.

Stations.	Main battery (Cal-laud).	Local battery (Cal-laud).	Cells in reserve (Cal-laud).
Bismarck, N. Dak.	10	2	10
Cooley's ranch, Arizona.	0	2	12
Fort Apache, Ariz.	30	2	0
Fort Grant, Ariz.	0	2	30
Fort Duchesne, Ariz.	30	2	8
Fort Yates, N. Dak.	26	2	29
Hellner's ranch, Ariz.	0	14	10
Holbrook, Ariz.	50	3	10
Mammoth, Ariz.	18	0	0
Price, Utah	30	2	12
Snowflake, Ariz.	0	2	0
San Carlos, Ariz.	0	3	8
Willcox, Ariz.	40	2	29
Total	234	38	158

TABLE 5.—Number of days and hours of interruption during the fiscal year.

Sections and branch.	Days.	Hours.
Willcox-Holbrook	64	7½
Willcox-Grant	0	0
Grant-Hellner's	10	1
Hellner's-San Carlos	23	2½
San Carlos-Fort Apache	15	7½
Fort Apache-Cooley's ranch	1	0
Cooley's ranch-Holbrook	14	8½
Fort Yates-Bismarck	7	8½
Price-Fort Duchesne	0	0
Fort Huachuca-Huachuca	0	0
Bisbee-San Bernardino	(1)	(1)
Hellner's ranch-Mammoth branch	10	7

¹ Operated by Bisbee Improvement Company.

APPENDIX No. 20.

REPORT OF FIRST-CLASS SERGT. HARRY W. CHADWICK, SIGNAL CORPS, ON SIGNAL CORPS EXHIBIT AT THE PAN-AMERICAN EXPOSITION, BUFFALO, N. Y.

BUFFALO, N. Y., *September 27, 1901.*

SIR: I have the honor to submit the following report relative to the Signal Corps exhibit, Government Building, Pan-American Exposition, Buffalo, N. Y., as directed:

In selecting this exhibit it was decided to use only such up-to-date apparatus and field equipment with which the public in general were not familiar and would prove highly interesting and instructive, and if possible allay the impression usually arising during these occasions "that the Government is being used as a medium or basis for advertising purposes." As most of our instruments are manufactured by commercial firms and bear their marks, it was therefore thought advisable to utilize only the field telegraphic day and night signaling, in order that practical demonstrations could be given daily to illustrate fully their uses during active field operations.

The exhibit is divided into four sections, and instruments, equipment, etc., for indoor explanatory purposes are arranged systematically in groups relative to their respective class of signaling, viz:

Section I.—Heliographs, lanterns, and other equipment for visual day and night signaling.

Section II.—Vibrators—telegraphic and telephonic—of different types; outpost cable cart and telephone sets, all electrically connected for illustration purposes.

Section III.—Wireless telegraph transmitting and receiving sets fully equipped for practical work, and Western Union telegraph instrument in circuit regulating time ball.

Section IV.—Official photographic enlargements of Philippine insurrection, photographed and enlarged by members of the Signal Corps.

The display is situated next to the wall on a side aisle, and occupies a floor space 15 by 20 feet, including 34-foot passages on either side, surrounded by partitions, standing uniformed figures, and mounted troopers on pedestals, entirely obstructing our view from the passing public in main aisle, and making it most difficult to locate.

APPARATUS FOR VISUAL SIGNALING.

On this equipment the heliograph has taken a prominent place in the minds of the informed and reading public and is attracting universal attention, for the important part it played during Western Indian campaigns, and valuable assistance rendered the besieged English troops at Ladysmith, South Africa, last year. The large attendance and extraordinary interest manifested during our daily signal work, from main entrance of Government Building to top of the Temple of Music fully indicates our efforts are eminently successful and appreciated by the audience. The setting up of the apparatus, adjustments with single and double mirrors with reference to the position of the sun and its manipulation, are clearly explained by Corporal Young and Private Thompson, who are fully conversant and expert signalmen, and deserve great credit for their skill, tact, and endless patience in performance of this and like duties.

WIRELESS-TELEGRAPHIC APPARATUS.

Unfortunately the space allowed for these instruments and accommodation of the public is entirely inadequate in proportion to the attendance, which is increasing daily; but the amount of interest and enthusiasm shown by the intelligent public, electricians, and others since its installation is most gratifying. Crowds begin to gather long before the advertised hours, and when the space will hold no more they perch themselves on elevated positions and there patiently await the designated time. The demonstration consists in its practical operation, transmitting and receiving messages, and a thorough simplified explanation, describing the working parts and theory of the entire apparatus. In order to expedite matters and satisfy public demands, it was found absolutely necessary to devote two hours daily—11 a. m. to 12 m. and 2 to 3 p. m.—exclusively to these exhibitions, giving an equal chance to all, preventing, so far as possible, the usual disgruntled feeling due from disappointment, as many of them no doubt denied themselves of other pleasures to be present.

EXPERIMENTAL FIELD APPARATUS.

During the four-days' conference of electrical experts held at the Temple of Music many of them took especial interest in this part of the display, and the result was a rigid inspection and test of all the most important electrical instruments. Many of them contended that, with exception of the wireless set, the field telegraphic and telephonic vibrator type "D" was the most practical and unique apparatus of the kind they had ever seen, when used in connection with the outpost cable and reel cart. They were highly elated and expressed much surprise at our success in carrying on communication over naked wire strung along the ground, with a six-foot break in the circuit.

PHOTOGRAPHS.

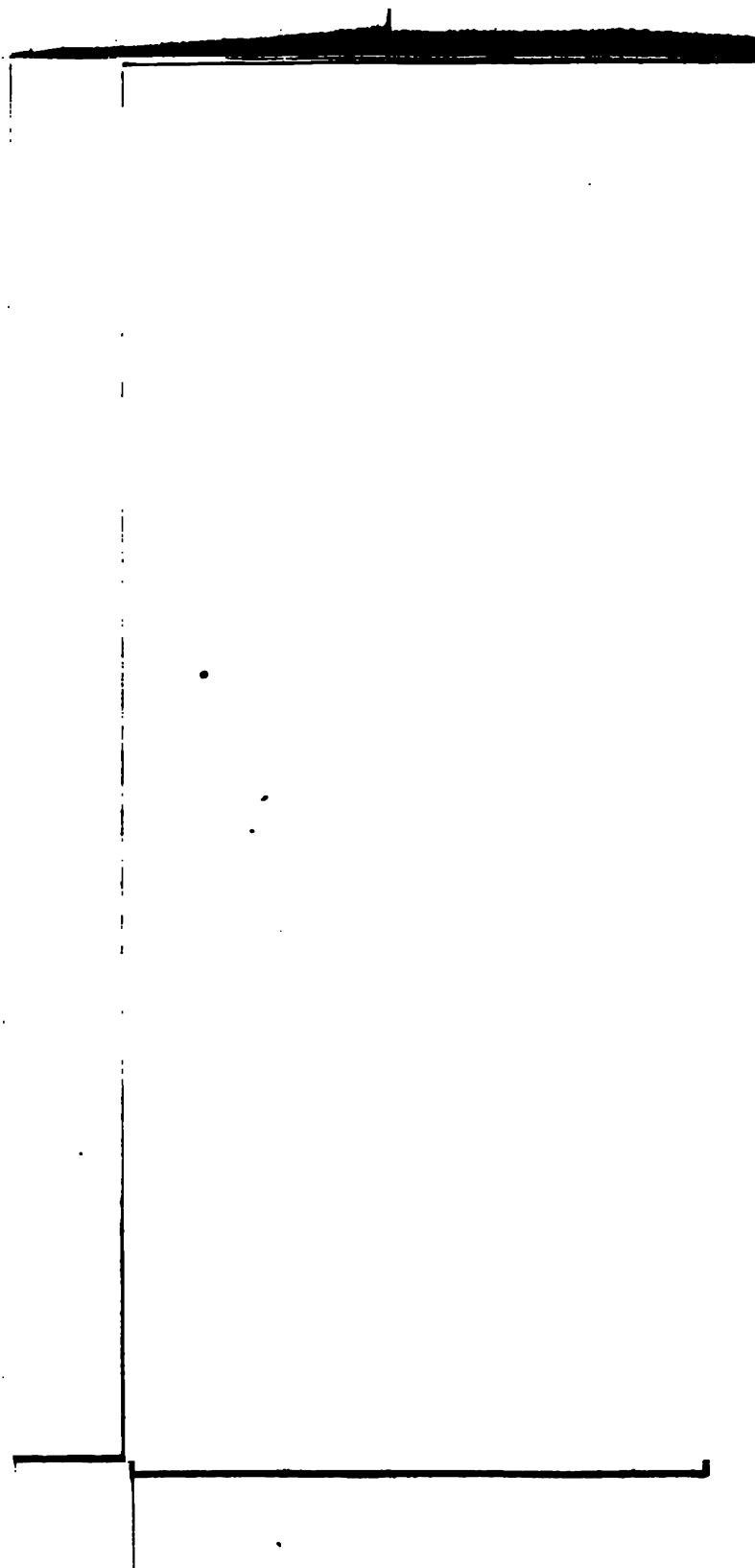
The fifty-two official photographic enlargements taken by the Signal Corps, representing the different regiments who served in the Philippines, and pictorially illustrating many incidents during active hostilities and operation of the American troops in Luzon, is a drawing card, and have received much attention from artists, photographers, and others who make a specialty of art. In many instances visitors have readily recognized among them friends or relatives engaged in active service. They have been tastefully matted, labeled with their respective data, and arranged in wall and partition panels which are of contrast in color, giving them the proper effect and showing them off to an advantage.

I would state that from an educational point of view the exhibit thus far is a decided success and fully warrants the expenditure and trouble involved. Many eminent professors, scientists, leading electricians, and prominent people of the United States, Canada, and other parts of the world have attended our demonstrations. They expressed much pleasure in having an opportunity to familiarize themselves with this branch of the service, and freely commended the high efficiency of the corps and the many modern resources used as a means of communication in the field under all circumstances, which seems to have been unknown to the public in general.

Very respectfully,

H. W. CHADWICK,
First-Class Sergeant, Signal Corps.









**REPORT OF THE CHIEF OF THE RECORD
AND PENSION OFFICE.**



REPORT

OF THE

CHIEF OF THE RECORD AND PENSION OFFICE.

RECORD AND PENSION OFFICE,
War Department, October 1, 1901.

SIR: It has been the custom, for purposes of comparison and for convenience of reference, to introduce into the annual reports of the Record and Pension Office a statistical table showing the number of cases received and disposed of during the fiscal year. In conformity with this practice, the following statement for the year ended June 30, 1901, is submitted:

Number of cases received and disposed of.

From the Pension Office	103, 916
From the Auditor for the War Department.....	32, 526
Remuster cases.....	1, 740
Desertion cases.....	2, 447
All other cases, miscellaneous	41, 353
Total	181, 982
On hand June 30, 1901.....	None.

These statistics, as compared with those for the preceding fiscal year, show a considerable reduction in the number of cases received and disposed of. As was to be expected from the large influx of cases immediately following the muster out of the Spanish war volunteers, the reduction is largely in the number of calls from the Commissioner of Pensions and the Auditor for the War Department for information from the records for use in the adjudication of claims on account of service during the war with Spain.

Of the 103,916 pension cases referred to in the statistical table 84,235 were calls from the Commissioner of Pensions for the military histories of officers and enlisted men in service during the civil war or other wars preceding the war with Spain, or for specific information relative to their service or that of the organizations to which they belonged, and 19,681 were calls from the same official for similar reports relative to officers and soldiers of the Spanish war and the organizations in which they served.

The cases received from the Auditor for the War Department embraced 17,388 calls for military histories or for information relating to service preceding the war with Spain, and 15,138 relating to service in that war.

Although the number of cases received during the year was less than the receipts for the fiscal year 1900, the number was fully up to

the average for preceding years, and, by reason of the new questions arising in connection with the status of officers and enlisted men of the Spanish war volunteers, the administrative work of the office was not diminished.

As usual since the organization of the Record and Pension Office, the public business has been promptly dispatched, nearly 93 per cent of the cases received during the fiscal year having been disposed of within twenty-four hours from the time they reached the office, and at the close of business hours on the 30th of June not one case remained unacted upon.

REMUSTER.

Under this head are classed the cases arising under the act of Congress approved February 24, 1897, "to provide for the relief of certain officers and enlisted men of the volunteer forces." This act, which is the last of a series of similar enactments, provides for the payment of volunteer officers of the civil war for services rendered under their commissions, under certain conditions, or which they were prevented from rendering by reason of casualties of the service. It also provides for the recognition of the rank conferred upon them by their commissions and gives to them and their heirs the pensionable status accruing from service in the grades as of which recognition is extended.

A reduced number of this class of cases was received during the last fiscal year, from which it may reasonably be inferred that the benefits of the act have been applied in a majority of the cases it was intended to reach.

It may be remarked that the conditions rendering necessary the legislation referred to were peculiar to the civil war and that similar legislation is not necessary for the relief of volunteer officers in service during the Spanish war and the Philippine insurrection.

REMOVAL OF CHARGES OF DESERTION.

The "desertion cases" referred to in the statistical table consist almost exclusively of applications for removal of the charge of desertion under the provisions of the act of Congress approved March 2, 1889, and the acts amendatory thereof. These acts relate only to regular and volunteer soldiers of the civil war and the war with Mexico, and have no application to service under more recent enlistments. Desertion cases, which have numbered many thousands in the past, are gradually diminishing in number, and a large percentage of those now presented are but renewals of former applications, many of which have been repeatedly denied. All of these cases, however, require careful consideration and administrative action and involve the expenditure of much time and labor in their adjudication.

But few applications for removal of the charge of desertion have as yet been presented by members of the Spanish war volunteers or the more recently disbanded regiments. There is, indeed, no law under which such applications can be considered, and it is a well-established rule of the Department that, in the absence of legislation requiring it, the War Department can not accept ex parte testimony to invalidate the records of disbanded organizations in cases where the records do not themselves afford reasons for questioning their accuracy.

MISCELLANEOUS CASES.

The miscellaneous or unclassified cases mentioned in the table include applications for original discharge certificates, for certificates in lieu of lost discharges under the act of March 3, 1873, for certificates of discharge in true name under the act of April 14, 1890, for recognition as veteran volunteers under reenlistments during the civil war, for medals of honor for former officers and soldiers of the civil war, inquiries from the several bureaus of the War Department, the adjutants-general of States, the Commissioner of the General Land Office, the Comptroller of the Treasury, the Court of Claims, the Civil Service Commission, the Grand Army of the Republic, the Loyal Legion, and kindred patriotic societies, and from the Soldiers' Homes, and the general correspondence of the office which can not be classified.

The unclassified cases also include an extensive correspondence with individual members of both Houses of Congress and the large number of reports furnished the various Congressional committees in response to calls for information and advice relative to pending legislation. These reports, dealing as they do with subjects of personal and public importance, involving the possible expenditure of large sums of money, necessarily require much labor and care in their preparation. Two hundred such reports were furnished during the last fiscal year.

INFORMATION INFORMALLY FURNISHED OTHER BUREAUS.

Besides the classified and unclassified cases heretofore mentioned there are many cases of which, though they require much time and labor for their disposition, no formal record is kept.

Among these may be enumerated calls from the Quartermaster-General of the Army for information in the adjudication of applications, under the act of February 3, 1879, and subsequent acts, for headstones to mark the graves of deceased volunteer soldiers; and calls from the Adjutant-General of the Army for the record of former volunteer soldiers with a view to their enlistment in the Regular Army, for the record of former officers of volunteers with a view to their reappointment in the volunteer service or to establish their relative rank as officers in the Regular Army, and for the record of former volunteer soldiers for the purpose of establishing their title to longevity pay under their enlistments in the Regular Army. All of these calls, and many others not easily enumerated, are informally received and answered.

On such informal calls reports were furnished to the Quartermaster-General during the months of May and June, 1901, in the cases of upward of 9,000 soldiers for use in the adjudication of applications for headstones alone, and it is estimated that during the fiscal year not less than 10,500 other cases were informally reported upon to the several bureaus of the War Department.

MEDALS OF HONOR.

The consideration of applications for the award of the Congressional medal of honor to officers and enlisted men of the volunteer forces forms a part of the business of the Record and Pension Office, and it

is believed that, in this connection, a brief history of the general subject of the issue of medals of honor and similar decorations may not be inappropriate.

It is to be observed that the "Congressional medal of honor" is but one of several similar decorations that have been authorized or issued at various times during and since the close of the civil war. As early as June 6, 1861, a resolution was adopted by the Chamber of Commerce of the State of New York ordering "the execution of a series of medals of a proper character to be presented to each officer, noncommissioned officer, and soldier engaged in the defense of Fort Sumter and Fort Pickens in the month of May, 1861;" and on November 29, 1862, at a meeting of officers representing the regiments which had served under Maj. Gen. Philip Kearny a resolution was adopted "for the purpose of procuring a medal in his honor," to be presented to all officers and soldiers who should be "promoted to the grade of commissioned officer previous to January 1, 1863," and who had "honorably served in battle under General Kearny in his division," and whose military records were "without stain." This medal was designated the "Kearny medal," and was to be presented upon the written order of "the presiding member or secretary of the committee" having the matter in charge. On March 13, 1863, an order was issued by Brig. Gen. D. B. Birney, commanding the First Division, Third Army Corps, announcing that a "Cross of valor," also known as the "Kearny cross," would be bestowed upon such noncommissioned officers and privates of that division as had most distinguished themselves in battle. In a subsequent order from division headquarters it was announced that the "Kearny cross" was the division decoration, and was bestowed in honor of the former division commander, General Kearny, and it is probable that the decoration was the one previously adopted by the committee appointed at the meeting of officers before referred to.

On June 15, 1863, it was announced by Major-General Banks, commanding the Department of the Gulf, that volunteers for the storming party formed for the expected assault upon the enemy's works at Port Hudson, should receive "a medal fit to commemorate the first grand success of the campaign of 1863 for the freedom of the Mississippi;" on June 29, 1863, an order was issued by the Secretary of War directing the Adjutant-General to provide "an appropriate medal of honor" for presentation to such troops as, after the expiration of their terms of enlistment, had offered their services to the Government during the Gettysburg campaign, and to troops from other States that had volunteered their temporary service in the States of Pennsylvania and Maryland; on October 2, 1863, an order was issued by Major-General McPherson, commanding the Seventeenth Army Corps, authorizing the issue of a "medal of honor with an appropriate device" to officers and enlisted men of the corps who had or should thereafter "most distinguish themselves during the war;" and on October 28, 1863, it was announced by Major-General Gillmore, commanding the Department of the South, that "medals of honor for gallant and meritorious conduct during the operations before Charleston" would be awarded by the commanding general to a number of the enlisted men of the command who had been "in action or on duty in the batteries and trenches."

On April 10, 1864, Major-General Burnside, commanding the Ninth Army Corps, in an order descriptive of the badge adopted for the

corps, announced that those who desired could "also wear a medal of the same design, made of gold or gilt, silver or white metal, bronze or copper, to be attached to the left breast of the coat as a pin, or suspended by a red, white, and blue ribbon." In his address to the "soldiers of the Army of the James," dated October 11, 1864, Major-General Butler, commanding that army, announced that "a special medal" would be struck in honor of certain colored soldiers of his command for gallantry in action; and on January 24, 1865, Major-General Howard, commanding the Army of the Tennessee, announced in general orders the award of medals of honor to certain enlisted men for "distinguished service in the field and other soldier-like qualities," but a few days later the order was "suspended," having been "issued under a misapprehension of the wishes of the commanding general," there being "no established method of extending the same principle of distribution from his own headquarters to the entire army."

On December 17, 1863, while the civil war was in progress, a special "gold medal" was awarded by Congress to Major-General Grant, with the thanks of that body to the general and to the officers and soldiers who fought under his command for their gallantry and good conduct in battle (13 Stat. L., 399), and on January 28, 1864, a gold medal was also awarded by Congress to Mr. Cornelius Vanderbilt, in consideration of the gift to the Government of the steamship bearing his name.

It is also interesting to note that the Confederate Congress authorized the bestowal of medals and badges of distinction "for courage and good conduct on the field of battle." This was done in an act approved October 13, 1862, of which the following is a copy:

The Congress of the Confederate States of America do enact, That the President be, and he is hereby, authorized to bestow medals with proper devices upon such officers of the armies of the Confederate States as shall be conspicuous for courage and good conduct on the field of battle; and also to confer a badge of distinction upon one private or noncommissioned officer of each company after every signal victory it shall have assisted to achieve. The noncommissioned officers and privates of the company who may be present on the first dress parade thereafter may choose, by a majority of their votes, the soldier best entitled to receive such distinction, whose name shall be communicated to the President by commanding officers of the company; and if the award fall upon a deceased soldier, the badge thus awarded him shall be delivered to his widow, or, if there be no widow, to any relative the President may adjudge entitled to receive it.

[Approved, October 13, 1862.]

This act of the Confederate Congress was published in an order from the adjutant and inspector general's office at Richmond November 22, 1862, and, difficulties having occurred in procuring the medals and badges of distinction, the names of those reported as worthy of the distinction were subsequently inscribed in a "roll of honor," to be preserved in the office of the adjutant and inspector general "for reference at all future time." It does not appear that either the medal or the badge of distinction authorized by the Confederate Congress was ever actually conferred, the preparation of the roll of honor being apparently the only action taken in execution of the provisions of the statute.

After the close of the war medals were issued by several States to survivors of the war or to their representatives.

On April 13, 1865, the legislature of the State of Ohio adopted the following:

Resolved by the general assembly of the State of Ohio, That the governor procure, or cause to be procured, for each veteran volunteer who reenlisted from this State under Order No. —, from the War Department in 1863, a bronze medal, 1½ inches

diameter, containing upon one side in bold relief the following or some similar sign, to wit: Ohio personified, crowning one of her soldiers with laurel; emblem—nat sheaf, eagle perched on shield bearing State arms. In the background: auner and tented field; springing from the wand which supports the liberty cap; buckeye-leaf clasp, a plain bar on which shall be raised the laurel and buckeye. The swivel of clasp in form of a monogram U. S. Upon the reverse side to be engraved the name of the recipient with his regiment, battalion, or battery, surrounded with a laurel wreath. The medal to be suspended by a piece of tricolor—k ribbon, and its artistic features to be equal to the "Crimean medal." The cost not to exceed 80 cents apiece.

April 13, 1865.

On February 1, 1866, the following joint resolution was adopted by the legislature of West Virginia:

Resolved by the legislature of West Virginia, That the governor procure, or cause to be procured, suitable medals as tokens of respect to the officers and soldiers of West Virginia who have served during the rebellion in the service of the United States, containing upon one side the name of the recipient, with his regiment, battalion, or battery, surrounded by a wreath; upon the reverse side some appropriate design and inscription. The medal to be suspended by a piece of tricolored silk ribbon; its artistic features to be equal to the Crimean medal, and its cost not to exceed \$1 each. The medals and inscriptions to be of four kinds:

1. For the officers and soldiers of the Volunteer Army who have been or may be honorably discharged from the service.
2. For the officers and soldiers who have been killed in battle.
3. For the officers and soldiers who have died from wounds received in battle.
4. For the officers and soldiers who have died from diseases contracted in the service.

The medals for the officers and soldiers who have been killed in battle or who have died of wounds or disease in the service to be delivered to the families of said officers and soldiers.

Adopted, February 1, 1866.

On the 26th of May, 1891, an appropriation was made by the legislature of Pennsylvania "for the purpose of procuring a suitable medal, with commemorative devices, for each of the surviving members, or their heirs, of the National Light Infantry, of Pottsville, Pennsylvania; the Washington Artillerists, of Pottsville, Pennsylvania; the Reading Artillery, of Reading, Pennsylvania; the Allen Rifles, of Allentown, Pennsylvania, and the Logan Guards, of Lewistown, Mifflin County, Pennsylvania, to commemorate the event of the said five companies being the first to respond to the call for troops by President Lincoln, of date April fifteenth, one thousand eight hundred and sixty-one, mustering at Harrisburg, Pennsylvania, on the eighteenth day of April, one thousand eight hundred and sixty-one, and reached Washington, District of Columbia, and were stationed in the Capitol building for its defense on the eighteenth day of April, one thousand eight hundred and sixty-one;" and on the 31st of May, 1893, an appropriation was made by the State legislature "for the purpose of procuring a suitable medal, with commemorative devices, for each of the surviving members, or their heirs, of the Worth Infantry and the York Rifles, of York, Pennsylvania, who went from the State of Pennsylvania into active service, fully armed and equipped, on the nineteenth day of April, one thousand eight hundred and sixty-one."

In or about the year 1896 (the exact date has not been found of record), a medal was struck, at private expense, for presentation to the survivors of the defenders of Fort Ridgely, Minn., in an engagement with hostile Indians in 1862. The medals were presented to the State, through its governor, by the committee having the matter in charge, and the State returned them to the committee for distribution.

It is probable that medals have been presented by other States to veterans of the civil war, but no record of such action has been found on the files of this office.

Besides the metal badge of the Ninth Army Corps to be worn on the left breast, as stated above, it was announced in orders by several corps commanders that the corps badges were to be of metal to be worn in the manner described, and after the close of hostilities badges were adopted by officers and enlisted men of the Army of the Cumberland to signalize and perpetuate the history of that army. Similar action was taken by the officers and enlisted men of the cavalry corps of the Military Division of the Mississippi, and it is possible that like action was taken by the members of other army corps prior to their disbandment, but no record of such action has been discovered.

It is not known how many medals were issued under any of the orders or authorizations cited above (save only the two authorized by special acts of Congress), though it is known that some medals were issued under some of the orders of military commanders, and the authorizations themselves are mentioned only as incidental to the general subject of the bestowal of medals of honor during and since the close of the civil war. It may, however, be stated that the storming party organized by General Banks did not make the contemplated assault and that the medals conditionally promised by him were not, therefore, given; that no money was ever appropriated for carrying out the provisions of the War Department order of June 29, 1863, and no medal was ever prepared or issued under that order; and that, as before stated, it is probable that no medal or badge of distinction was ever conferred under the act of the Confederate congress quoted above.

The general legislation by the Congress of the United States authorizing the issue of medals of honor is found in a joint resolution approved July 12, 1862, and section 6 of the sundry civil appropriation act of March 3, 1863. These enactments are as follows:

A RESOLUTION to provide for the presentation of "medals of honor" to the enlisted men of the Army and volunteer forces who have distinguished or may distinguish themselves in battle during the present rebellion.

Resolved by the Senate and House of Representatives of the United States of America in Congress assembled, That the President of the United States be, and he is hereby, authorized to cause two thousand "medals of honor" to be prepared with suitable emblematic devices, and to direct that the same be presented in the name of Congress to such noncommissioned officers and privates as shall most distinguish themselves by their gallantry in action and other soldier-like qualities during the present insurrection; and that the sum of ten thousand dollars be, and the same is hereby, appropriated out of any money in the Treasury not otherwise appropriated, for the purpose of carrying this resolution into effect.

Approved, July 12, 1862. [12 Stat. L., 623.]

AN ACT making appropriations for sundry civil expenses of the Government for the year ending June thirty, eighteen hundred and sixty-four, and for the year ending the 30th of June, 1863, and for other purposes.

* * * * *

SEC. 6. *And be it further enacted,* That the President cause to be struck from the dies recently prepared at the United States mint for that purpose "medals of honor" additional to those authorized by the act [resolution] of July twelfth, eighteen hundred and sixty-two, and present the same to such officers, noncommissioned officers, and privates as have most distinguished or who may hereafter most distinguish themselves in action; and the sum of twenty thousand dollars is hereby appropriated out of any money in the Treasury not otherwise appropriated, to defray the expenses of the same.

* * * * *

Approved, March 3, 1863. [12 Stat. L., 751.]

several years these were carefully considered by the Secretary or the Assistant Secretary of War, upon their presentation by the Chief of the Record and Pension Office, but no authoritative rules for the guidance of the Department in dealing with this class of cases were formulated until January 26, 1897, when, by direction of the President, a systematic plan of administration was incorporated into the Army Regulations. The order publishing the new rules, in so far as they apply to the volunteer forces, is as follows:

WAR DEPARTMENT, *Washington, June 26, 1897.*

By direction of the President the following regulations are promulgated respecting the award of medals of honor, and paragraph 177 of the Regulations is amended to read as follows:

177. Medals of honor authorized by the act of Congress approved March 3, 1863, are awarded to officers and enlisted men, in the name of the Congress, for particular deeds of most distinguished gallantry in action.

1. In order that the Congressional medal of honor may be deserved, service must have been performed in action of such a conspicuous character as to clearly distinguish the man for gallantry and intrepidity above his comrades—service that involved extreme jeopardy of life or the performance of extraordinarily hazardous duty. Recommendations for the decoration will be judged by this standard of extraordinary merit, and incontestable proof of performance of the service will be exacted.

2. Soldiers of the Union have ever displayed bravery in battle, else victories could not have been gained; but, as courage and self-sacrifice are the characteristics of every true soldier, such a badge of distinction as the Congressional medal is not to be expected as the reward of conduct that does not clearly distinguish the soldier above other men whose bravery and gallantry have been proved in battle.

3. Recommendations for medals on account of services rendered in the Volunteer Army during the late war * * * will, if practicable, be submitted by some person other than the proposed recipient, one who is personally familiar with all the facts and circumstances claimed as justifying the award; but the application may be made by the one claiming to have earned the decoration, in which case it will be in the form of a deposition, reciting a narrative description of the distinguished service performed. If official records are relied on as evidence proving the personal service, the reports of the action must be submitted or cited; but if these records are lacking the testimony must embrace that of one or more eyewitnesses, who, under oath, describe specifically the act or acts they saw wherein the person recommended or applying clearly distinguished himself above his fellows for most distinguished gallantry in action.

* * * * *

R. A. ALGER,
Secretary of War.

It is proper here to note that the joint resolution of July 12, 1862, authorized the presentation of the medal of honor only to such non-commissioned officers and privates as should "most distinguish themselves by their gallantry in action, and other soldier-like qualities," during the then present insurrection, while the subsequent enactment of March 3, 1863, enlarged the class of persons who might receive the medal by including officers, and also extended the time indefinitely during which it might be earned or won, but the former provision which sanctioned its presentation for "other soldier-like qualities" was omitted in the second statute.

It may possibly be a legal question whether or not the second statute repealed the first, but it is not a material one, because the first statute has been rendered inoperative by the regulation prescribed by the President, which limits the award of medals to the class provided for by the act of March 3, 1863, viz, "such officers, noncommissioned officers, and privates" as have "most distinguished themselves in action," or, as stated in the regulation, "to officers and enlisted men * * * for particular deeds of most distinguished gallantry in action."

The vitality of the second statute (section 6 of the act of **March 3, 1863**) has itself been questioned. In 1891 the Acting Judge Advocate-General of the Army expressed the opinion that it was repealed by the general repeal provisions of the Revised Statutes, but it was held by the Acting Secretary of War (Assistant Secretary Grant) that there was sufficient authority to justify a distribution of the medals then on hand. And in 1892 the Attorney-General held that in the absence of contemporaneous record evidence of the facts alleged in support of an application for the award of a medal of honor, the act of **March 3, 1863**, should not be regarded as authority for a bestowal of the medal as a reward for gallantry alleged to have been displayed during the civil war—this on the mere ground of delay unaccounted for in making the application, and “in obedience to a principle of general jurisprudence based on the teaching of experience that the lapse of time carries with it the memory and life of witnesses, the muniments of evidence, and the other means of judicial proof.”

The War Department, however, has not refused to consider applications filed under the act of 1863 on the ground of any supposed insufficiency of the law or merely because of the lapse of time in making an application, even though the facts alleged as the basis of an application may not have been established by record evidence; and the sufficiency of the law appears to have been recognized by Congress in the joint resolution of May 2, 1896 (to be further referred to in this report), in which the Secretary of War was authorized to issue ribbons or knots to be worn in lieu of, and ribbons to be worn with, medals of honor which had been, or might thereafter be, awarded under the provisions of the joint resolution of July 12, 1862, and the act approved **March 3, 1863**.

The act of **March 3, 1863**, does not distinctly authorize the award of more than one medal to any one person; and for this reason, as well as because it has never been thought advisable to issue two or more medals of the same kind to the same person, the Department has almost always declined to consider any application for such award. It is believed that in the very few cases in which the second medal has been awarded to the same person the award was made through oversight and in ignorance of the fact that a previous award had been made to that person.

It is doubtless just and proper that an officer or enlisted man should receive due recognition for each and every distinct act of gallantry by which he may distinguish himself in action, and in February last the Secretary of War, in a letter addressed to the chairman of the Senate Committee on Appropriations, suggesting that a small appropriation be made for engraving such medals of honor as might be awarded under the act of **March 3, 1863**, also suggested that legal provisions be made for the issue of a bar or clasp, in lieu of an additional medal, to any officer or enlisted man who should earn the medal by gallantry in action on more than one occasion. It was also recommended that it be provided by legislative enactment that no award of a medal of honor, or of the bar or clasp suggested, should be made after the lapse of more than three years from the date of the performance of the act for which such award shall be claimed. It is proper to state that, possibly because of the proximity of the close of the session, these suggestions were not productive of the desired results.

Under the new regulations prescribed by the President, in con-

formity with the act of March 3, 1863, applications for the award of medals of honor to former officers, noncommissioned officers, and privates of the volunteer forces in service during the civil war are received and recorded in the Record and Pension Office, where the necessary preliminary correspondence is conducted and a brief of each perfected case is prepared. This brief contains a quotation of the testimony submitted, together with so much of the military history of the candidate and his witnesses, and other data from the records, as will enable the reviewing officer (the Secretary or Assistant Secretary of War) to reach a just conclusion in the premises.

After the lapse of more than a third of a century since the occurrence of the events upon which applications are based, it is essential that the testimony of witnesses shall receive close and careful consideration, especially as such testimony is frequently given to oblige a comrade, friend, or neighbor, and is seldom influenced by the sense of official responsibility essential to the establishment for a claimant of a soldierly character above that of his fellows. It is not surprising, therefore, in view of the lapse of time, the lack of responsibility of testifying witnesses, and the absence, generally, of a contemporaneous record confirmatory of the allegations made, that in a majority of cases the evidence is not found sufficient to establish the eligibility of the candidate for the decoration sought to be conferred upon him.

It is shown by the records that during the last fiscal year 60 applications for the medal of honor were received from or in behalf of former officers and enlisted men of the volunteer forces in service during the civil war, and that on these applications four medals were awarded.

In connection with the general subject of the issue of medals of honor, it is believed that the following tables are of sufficient interest to justify their insertion in this report:

Congressional medals of honor.

TABULATED BY CALENDAR YEARS.

Year.	Volun- teers.	Regulars.	Civilians.	Total.	Year.	Volun- teers.	Regulars.	Civilians.	Total.
1863.....	20			20	1884.....	4	1		5
1864.....	94	3		97	1885.....				
1865.....	1,154	1		1,155	1886.....	3			3
1866.....	13	1	1	15	1887.....	13	1		14
1867.....	6	1	1	8	1888.....	9	1		10
1868.....		2		2	1889.....	7	1		8
1869.....		53		53	1890.....	21	12		33
1870.....	9	77	1	87	1891.....	37	30		67
1871.....	4	7		11	1892.....	64	9		73
1872.....	4	15	1	20	1893.....	59	8		67
1873.....	3			3	1894.....	125	24		149
1874.....	2	8	2	12	1895.....	62	6		68
1875.....	1	58	6	65	1896.....	88	7		95
1876.....	1	13		14	1897.....	112	18		130
1877.....	1	39		40	1898.....	58	8		66
1878.....	2	33		35	1899.....	27	31		58
1879.....	3	2		5	1900.....	10	3		13
1880.....	4	12		16	1901 ¹	1			1
1881.....									
1882.....		4		4	Total..	2,023	489	13	2,525
1883.....	2			2					

¹ Including 864 to members of the Twenty-seventh Maine Infantry. See page 10, ante.

² To June 30, 1901.

Congressional medals of honor.—Continued.

TABULATED BY STATE AND UNITED STATES ORGANIZATIONS.

	Issued to June 30, 1901.		Issued to June 30 1901		Issued to June 30, 1901.
Regular Army.....	189	Nebraska.....	1	Veteran Reserve	
Connecticut.....	21	New Hampshire.....	19	Corps.....	30
Delaware.....	7	New Jersey.....	29	United States Sharp-	
Illinois.....	90	New York.....	296	shooters.....	2
Indiana.....	44	Ohio.....	127	General and staff offi-	
Iowa.....	28	Pennsylvania.....	152	cers of volunteers.....	27
Kansas.....	1	Rhode Island.....	15	Civilians.....	13
Kentucky.....	5	Tennessee.....	2	United States Volun-	
Louisiana.....	3	Vermont.....	42	teers.....	1
Maine ¹	888	Virginia.....	6		
Maryland.....	15	West Virginia.....	28	Total.....	2,825
Massachusetts.....	63	Wisconsin.....	15		
Michigan.....	51	United States Colored			
Minnesota.....	15	Troops.....	27		
Missouri.....	29				

¹ Including 864 to members of the Twenty-seventh Maine Infantry. See page 10, ante.

TABULATED BY GRADES

NOTE.—The rank given in this table is that held by recipients at the dates of the events for which medals were awarded, without regard to any higher rank subsequently attained. Thus the medals issued to several general officers of the Regular Army are accounted for in the table among the number of awards to officers of volunteers of lower grades.

Rank.	Volunteers.			Regular Army.	Civilians.	Total.
	Twenty- seventh Maine ¹	All other volunteers.	Total vol- unteers.			
Major-generals.....		3	3			3
Brigadier-generals.....		9	9			9
Colonels.....	1	35	36			36
Lieutenant-colonels.....	1	17	18			18
Majors.....	1	29	30	2		32
Surgeons.....	1	3	4	1		5
Assistant surgeons.....	2	5	7			9
Captains.....	10	84	94	15		109
Lieutenants.....	22	117	139	53		192
Chaplains.....	1	3	4			4
Sergeant-majors.....	1	16	17	3		20
Hospital stewards.....				1		1
Sergeants.....	32	274	326	136		462
Corporals.....	79	156	235	65		300
Privates.....	676	382	1,058	179		1,237
Musicians.....	8	21	29	14		43
Blacksmiths.....	1	1	2	7		8
Farriers.....	1	1	2	7		8
Saddlers.....		1	1	3		4
Wagoners.....	9		9	1		10
Scouts and guides.....					11	11
Quartermaster's employees.....					1	1
Contract surgeons.....					1	1
Total.....	864	1,159	2,023	489	13	2,525

¹ See page 10, ante.

MEDAL OF HONOR RIBBON AND BOWKNOT.

By a joint resolution of Congress approved May 2, 1896, the Secretary of War was authorized to issue to any person to whom a medal of honor had been or might thereafter be awarded under the provisions of the joint resolution of July 12, 1862, and the act of March 3, 1863, a rosette or knot, to be worn in lieu of the medal, and a ribbon to be

worn with the medal, each to be of a pattern to be prescribed and established by the President.

On the 10th of November, 1896, the Secretary of War described in orders the pattern of the ribbon and knot as determined by the President; and on February 18, 1897, he issued regulations for the distribution of the decorations, the distribution to former members of the Volunteer Army to whom medals of honor had been awarded to be made by the Chief of the Record and Pension Office. These regulations require that the applicant shall be identified by the sworn testimony of at least two reputable persons, who have had a personal acquaintance with him for a period of not less than five years.

The contract for furnishing the ribbons and knots provided for by the joint resolution of May 2, 1896, was given to Messrs. Tiffany & Co., of New York, who were authorized by the Secretary of War to sell them to persons entitled to wear them, under conditions indicated in a letter, of which the following is an extract:

WAR DEPARTMENT, OFFICE OF THE SECRETARY,
Washington, February 18, 1897.

MESSRS. TIFFANY & Co.,
New York, N. Y.

GENTLEMEN: Referring to your letter of the 5th instant, relative to the ribbon for the medal of honor and the bowknot to be worn in lieu of the medal, I have the honor to advise you as follows in reply to your several inquiries:

* * * * *

While the Department is authorized by the joint resolution approved May 2, 1896, to issue a new ribbon to replace any ribbon previously issued under the provisions of that resolution, which shall have been lost, destroyed, or rendered unfit for use, without fault or neglect on the part of the person to whom it was issued, it is probable that many wearers of the medal will prefer to procure new ribbons by purchase rather than to make application to the Department for a gratuitous issue of them. In view of this probability, it is considered desirable that you should keep a supply of the ribbon on hand for sale to those who may be entitled to wear it and who may desire to purchase it, provided that you will adopt such rules as will restrict its sale to those who are entitled to wear it.

The Department has authority under the law to issue to each recipient of the medal a single bowknot to be worn in lieu of the medal, but it has no authority to issue knots to take the place of those that may have been lost, destroyed, or rendered unfit for use. There will undoubtedly be a large demand for the knots owing to the fact that, being constantly worn, it will be necessary to replace them very frequently. It is considered desirable, therefore, that you should keep a supply of the knots on hand, their sale being subject to the same restrictions as those which should govern the sale of the ribbon.

It is suggested that the sale of both the ribbon and the bowknot should be rigidly restricted to those who present evidence of their right to wear them, such evidence to be either the exhibition of the medal itself, of a certificate of membership in the Medal of Honor Legion, or of an official statement from this Department that a medal has been awarded. The Medal of Honor Legion may desire to make special arrangements with you for supplying its members with the ribbon and the knot, and, with this end in view, it is suggested that it may be advisable for you to correspond with the officials of that association. But it should be observed that there are many recipients of the medal who are not members of the Medal of Honor Legion, and for whom, consequently, that association can not properly make any rules or arrangements. The sale of the ribbon or the knot to such persons should not be refused, provided they can produce evidence of their right to wear them, such evidence to be either the exhibition of the medal itself or of a statement from this Department to the effect that a medal has been awarded. Should you be in doubt at any time as to the right of any particular individual to wear the medal, the ribbon or knot, the Department will, upon your application, promptly advise you as to the facts in the case.

Very respectfully,

DANIEL S. LAMONT,
Secretary of War.

Under the provisions of the law and the established regulations 417 ribbons and 613 knots were issued by this office to former officers and enlisted men of the volunteer forces up to the close of the last fiscal year.

CODIFICATION OF RULES OF PRACTICE.

Considerable attention was given during the past year to a codification of the rules of practice in cases coming before the office and involving questions concerning the construction of the laws and War Department orders and regulations affecting the status of former officers and enlisted men of the volunteer forces. For this purpose typical cases were carefully briefed and referred to the Judge-Advocate-General of the Army, and his conclusions were subsequently submitted to the Secretary of War for an authoritative decision upon the questions involved. For convenience of reference, and to secure a uniform application of the rules thus established, the opinions of the law officer of the Department and the action of the Secretary of War thereon have been printed in the form of circulars, from which the following syllabi are extracted in chronological order:

1. CIRCULAR OF SEPTEMBER 20, 1900.

- (a) *Dates of discharge of volunteer officers and enlisted men who are absent from their commands when these are mustered out of service.*
The regulations of 1898 (published in General Orders, No. 124, of that series) had the same effect as those of 1863 (published in General Orders, No. 108, of 1863)—that is, to discharge all absentees not retained in service by competent authority on the dates of the muster out of the organizations to which they belonged.
- (b) *Nunc pro tunc procedure on the part of the War Department.*
It is not competent for the War Department to issue orders affecting the past history of officers and soldiers which shall undertake to introduce into it as a fact happening on a given date something which did not actually occur at the time stated. Orders, in the cases of officers or enlisted men, directing or making appointments, acceptances of resignations, discharges from service or muster out of service, to date from or take effect from dates prior to the issuance of the orders therefor are illegal.

2. CIRCULAR OF FEBRUARY 15, 1901.

- (a) *Discharge; fourth article of war.*
A certificate of discharge is not necessary to a discharge, but a soldier may be discharged without a certificate or before he is furnished with a certificate, upon notice, actual or constructive, and when volunteers are mustered out it is that act that separates them from the service.
- (b) *Muster out; discharge furlough.*
A discharge furlough (civil war), so called, was in fact a discharge from the service, the discharge certificate, if any, subsequently furnished, being evidence only of the fact of prior discharge.

3. CIRCULAR OF MARCH 18, 1901.

- (a) *Public records.*
A muster-in roll of a volunteer officer, prepared by a public officer authorized to perform that function, and filed in the Record and Pension Office, is a public record and is to be accepted as showing the correct record of muster into service in preference to a roll submitted by the interested officer.
- (b) *Nunc pro tunc musters in.*
The War Department can not recognize the authority of a mustering officer to muster in an officer on one date, to date from an earlier date, and recognize the officer so mustered in as of the grade conferred by such muster in from the earlier date mentioned in the muster-in roll.

(c) *Constructive muster in.*

In the absence of legislation requiring it, the War Department can not recognize a volunteer officer as having held the grade to which he was commissioned, even though he may have been in the performance of the duties of the grade, in an organization in which there was a legal vacancy, unless he was actually mustered in. Officers of volunteers appointed by governors of States can not be constructively mustered in.

(d) *De facto officers.*

Under certain circumstances persons may be de facto officers without muster in; but de facto officers can not themselves acquire rights based on their defective title.

(e) *Appointment of officers.*

The constitutionality of past legislation vesting in the States the appointment of officers of volunteers should not now be questioned.

4. CIRCULAR OF MARCH 23, 1901.

(a) *Relative rank.*

In determining the relative rank of officers under section 1219, Revised Statutes, the period between enrollment and muster in can not be counted.

(b) *Acceptance of volunteers into the military service of the United States.*

Enrollment for service in the Volunteer Army is only a declaration of an intention to enter such service. The muster in fixes the date of commencement of service, as the muster out fixes the date of its termination. There can be no entry into the military service of the United States without the consent of the United States.

(c) *Status of volunteers between dates of enrollment and muster in.*

An act of Congress granting pay for the period between enrollment and muster in is a recognition of the fact that volunteers were not in the service of the United States during that period. Had they been, no such legislation would have been necessary.

5. CIRCULAR OF MARCH 25, 1901.

Acceptance of volunteers into the military service of the United States.

In raising the volunteer troops of the civil war and of 1898, there were three parties to the act—the individual, the State, and the United States. Acceptance by the United States completed the act.

Officers were accepted in the grades to which they were appointed and the well-established method of accepting them was by muster in.

When, after a regiment had been mustered in, a vacancy in an office occurred and an appointment to it was to be made, by promotion or otherwise, the concurrence of the United States was essential, and this concurrence was again evidenced by a muster in. A former muster in related to the appointment then made; it could not possibly cover a subsequent appointment to another office.

6. CIRCULAR OF MAY 3, 1901.

Inviolability of the records of the War Department.

In the absence of legislation requiring it, the War Department can not accept ex parte affidavits to invalidate records which do not themselves present reasons for questioning their accuracy. But this should not be held to exclude them in the case of disagreeing records when they are offered for the purpose of sustaining one of the records, although impeaching the other.

7. CIRCULAR OF MAY 22, 1901.

Construction of records of discharge.

An enlisted man can not be held to have been discharged on account of disability (a) unless the official record shows specifically that he was so discharged, or (b) unless the order under which he was discharged directed that he be discharged on account of disability.

A commissioned officer can not be held to have been separated from the service on account of disability (a) unless the fact is specifically shown by the official records, or (b) unless the order discharging him or accepting his resignation was

based upon a physician's certificate of disability and the records do not show any other ground for the issuance of the order than the disability of the officer, or (c) if the resignation was tendered on account of disability and other grounds additional thereto, unless the records show that the officer was seriously disabled at the time of tendering his resignation.

Except under the conditions set forth in the first of these rules, the discharge of an enlisted man upon an application made by him or in his behalf, and not upon surgeon's certificate of disability in the manner prescribed by Army Regulations, must be held to have been a discharge by way of favor, notwithstanding the fact that disability may have been alleged as the basis for the application or that the records may show that the soldier was more or less disabled prior to his discharge.

Except under the conditions set forth in the second of these rules, the acceptance of a resignation tendered by an officer on grounds other than that of disability exclusively can not be held to have been a separation from the service on account of disability, notwithstanding the fact that the records may show that the officer was more or less disabled prior to his separation from service or that disability may have been alleged as one of the reasons for tendering his resignation.

8. CIRCULAR OF JUNE 1, 1901.

Character of discharge.

An officer of volunteers who was discharged by reason of the muster out of his company, he being absent without leave at that time, is held to have been discharged without honor.

The discharge without honor is distinguished from the honorable discharge and the dishonorable discharge. Since 1892 it has been recognized as an absurdity that a soldier whose status or condition at the time of his discharge was not one of honor should be held to have been honorably discharged. It was an error to hold, as the War Department did previously, that if a discharge was not dishonorable—i. e., by sentence of court-martial—it must have been honorable.

In holding that, under General Orders, Nos. 108 of 1863, 124 of 1898, and 13 of 1899, an absentee from a volunteer organization on the date of muster out thereof was discharged on that date it is not held that any deserter was so discharged. It is held that those orders did not operate to discharge deserters from service.

It may be remarked that the partial codification of the rulings of the Department relating to the questions arising in the administration of the current business of this office has proved to be of such value as to encourage a further prosecution of the work.

RECORDS—SPANISH WAR AND PHILIPPINE INSURRECTION.

By the act of Congress approved May 9, 1892, establishing the Record and Pension Office as a bureau of the War Department, the Chief of that office was charged with the custody, under the Secretary of War, of the military and hospital records of the volunteer armies, and the transaction of the business of the War Department connected therewith, and in the act of April 22, 1898, under which the Volunteer Army in service during the war with Spain was created, it was specifically provided that upon the disbandment of the volunteer and militia organizations the records pertaining to them, including the reports of medical officers serving with the volunteer troops and the records kept by such officers, should be filed in the Record and Pension Office.

Under these enactments the military and hospital records of the Spanish war were filed in this office, and during the closing months of the last fiscal year the records of 13 of the 26 regiments of volunteers organized under the act of March 2, 1899, for service in the Philippines and in the island of Porto Rico, were received. The records of 9 additional regiments of the latter class have been received since the close of the fiscal year.

As will be seen from another portion of this report, the records of individual military service and medical treatment of the Spanish war volunteers have been reproduced by the index-record card system applied to the records of all other classes of disbanded volunteers, and the work of carding the records of the more recently disbanded regiments is now in progress.

It may be of interest to state that the records of the Spanish war volunteers include those of 6 regiments and 9 independent companies of cavalry; 1 regiment, 6 battalions, and 22 independent batteries of artillery; 3 regiments of engineers; 163 regiments, 2 battalions and 2 independent companies of infantry, and 19 companies of the signal corps. The disbanded volunteer organizations recently in service in the Philippine Islands numbered 1 regiment of cavalry and 24 regiments of infantry. The Porto Rican regiment or battalion numbered 8 companies, 4 of which were mounted.

No statistics showing the number of volunteer troops in service during the Spanish war and the Philippine insurrection have yet been prepared by this office.

INDEX-RECORD CARD WORK.

The work of reproducing, by the index-record card system, the records of individual military service and medical and surgical treatment and the objects for which that work was undertaken have been fully described in previous reports. At the date of the last annual report the carding of the records of the Revolutionary war and subsequent wars to the beginning of the war with Spain had been virtually completed, and the work of carding the records of the Spanish war volunteers was well advanced.

During the last fiscal year the work was continued with such of the clerical force of the office as was available for the purpose, with the result that at the close of the year, on the 30th of June last, all of the individual military and medical records of Spanish war volunteers had been reproduced, with the exception of such fragmentary records of medical treatment as had not then been received. These delayed records are being carded as fast as they reach the office, and it is hoped that the card records of the Spanish war will soon be complete.

Toward the end of the fiscal year the records of some of the volunteer regiments organized for service in the Philippine Islands were received, and the work of carding the medical records was at once begun. This work is now well under way, and preparations are in progress for carding the military records of these recently disbanded regiments.

The index-record card work for the fiscal year included the preparation of 765,819 military cards and 192,094 medical cards, making, with the number prepared in previous years, a total of 42,381,907 of the former and 7,560,444 of the latter class, aggregating 49,942,351 index-record cards prepared up to and including June 30, 1901.

In addition to the index-record cards, 3,178 reference cards were made from miscellaneous records of the Revolutionary war. These records are of such a character that they can not well be reproduced in the ordinary form of index-record cards, but by the system adopted any name, however incidentally appearing therein, can readily be found.

RECORDS OF THE REVOLUTIONARY WAR AND WAR OF 1812.

By an act of Congress approved July 27, 1892, it was provided that the "military records of the American Revolution and of the war of 1812," then "preserved in the Interior and Treasury Departments," should be transferred to the War Department, to be "preserved in the Record and Pension Division [Office] of the Department," and that they should be "properly indexed and arranged for use;" and by an act approved August 18, 1894, it was further provided that "all military records, such as muster and pay rolls, orders, and reports relating to the personnel or the operations of the armies of the Revolutionary war and the war of eighteen hundred and twelve," then filed in any of the Executive Departments, should be transferred to the War Department, "to be preserved, indexed, and prepared for publication."

As a result of this legislation a large mass of records has been received from the State, Treasury, and Interior Departments, and these records have been reproduced by the index-record card system previously adopted for the records of the civil war, thus complying with the statute requirement that they be "properly indexed and arranged for use."

It is proper to remark, however, that the collection of records of the Revolutionary war filed in this office is very far from complete, and that there is no complete collection of such records in existence anywhere. It is hoped that the War Department collection will be largely augmented by the loan of such Revolutionary records as are now in the custody of the authorities of the several States and of historical societies. Such records have been loaned by the States of Vermont, New Hampshire, and New York, and the originals, after having been copied, have been returned to their former custodians. It is expected that this example will be followed by the authorities of other States and by the historical societies having such collections, and that the collection in this Department will thus be made as nearly complete as it is possible to make it after the long lapse of time since the Revolutionary armies were disbanded. The efforts of the War Department to complete its collection have, however, been interrupted by the pressure brought to bear upon this office by the increased correspondence and other work resulting from the war with Spain and the Philippine insurrection, including the carding of the records of the volunteer forces engaged therein, which was essential to the prompt transaction of the current business of the office in the thousands of cases in which a reference to such records becomes necessary.

It will be observed that the act of August 18, 1894, referred to above, contemplated the publication of the records of the Revolutionary war and the war of 1812, though it does not specifically authorize it. Congress will doubtless make the necessary appropriation for the publication at the proper time, but it is clearly not advisable to undertake the publication of any portion of the records of the Revolutionary war until the War Department collection is made as nearly complete as it is possible to make it. It will readily be seen that there are many difficulties in the way of obtaining missing records, and that progress in this direction must necessarily be slow. The date of the contemplated publication is therefore uncertain and is probably somewhat remote.

PUBLICATION OF THE OFFICIAL RECORDS OF THE UNION AND CONFEDERATE ARMIES.

The fiscal year ended June 30, 1901, was a notable one in the history of the Record and Pension Office in that it witnessed the practical completion of the work, for many years in progress, of the publication of the Official Records of the Union and Confederate Armies.

At the date of the last annual report the work had been completed with the exception of the general index, the preparation of which, the final volume of the publication, was then in progress. During the last fiscal year the work was prosecuted with such success that it was virtually completed, the final cards, embracing the text of the general index, having been sent to the Public Printer on the 22d of June and the typographical work in preparation for the first proof having been completed on the 29th of the same month.

It is difficult to convey an adequate idea of the labor involved in the preparation of this final volume of the publication. The published records are made up of official reports, correspondence, orders, returns, maps, and other documents, and comprise, excluding the atlas, a total of 125,730 pages of text. In addition to the text, each book contains a full index, so that there are in all 127 book indexes, containing a total of 11,563 pages. To condense these into a single index of a size convenient for handling has been a difficult task, but as finally completed the general index contains the substance of the separate indexes condensed into 1,087 pages, a reduction of 90 per cent in the number of pages of original matter.

At the beginning of the last fiscal year the cards of the proposed general index numbered about 700,000. In the process of elimination, verification, and identification these cards were handled many times, being gradually reduced until the number finally sent to the printer was but little more than 250,000. It is estimated that the total number examined by the compilers during the year, counting each examination as that of a separate card, was 2,200,000.

In a work of the magnitude of the War Records some errors, especially in the names of individuals, were unavoidable, and in the early stages of the publication it was difficult, and at times impossible, for the War Records Office to identify persons mentioned in the text, but as the work progressed and the compilers became more familiar with the records from which the material was selected these difficulties in a great measure disappeared, facilitating the avoidance of further errors and making possible the detection and rectification of those previously made. The corrections of errors and deficiencies discovered in the course of the work have been compiled and are set forth in the "Additions and Corrections," which form a part of the volume containing the general index.

In reporting the completion of the final volume of the Official Records of the Union and Confederate Armies, a brief history of the publication seems to be appropriate.

The actual initiative of the project to publish the records of the civil war appears to have been taken by Congress in a joint resolution, approved May 19, 1864, directing the Secretary of War to furnish the superintendent of public printing with copies of correspondence and other documents relating thereto, of every description, in the possession of the War Department subsequent to December 1, 1860. In

accordance with this resolution the work of preparing the records for convenient use was begun by Col. E. D. Townsend, assistant adjutant-general, then in charge of the Adjutant-General's Office and subsequently Adjutant-General of the Army, who caused copies to be made of battle reports on file in his office and took some steps toward the collection of missing records.

The first decisive step toward the publication of the records was taken when, by an act approved June 23, 1874, an appropriation was made "to enable the Secretary of War to begin the publication of the records of the war of the rebellion, both of the Union and Confederate armies." Under this act the preliminary work was resumed by General Townsend. Subsequently, under meager appropriations, the work was continued in a somewhat desultory manner by various officials until December 14, 1877, when the Secretary of War, perceiving that the undertaking needed the undivided attention of a single head, detailed Capt. Robert N. Scott, Third United States Artillery (subsequently major and lieutenant-colonel of that regiment), to take charge of the work. This officer devised the scheme of publication subsequently followed to the end of the work. He continued in charge until his death, March 5, 1887, when he was succeeded by Col. H. M. Lazelle, Twenty-third United States Infantry, who remained in control until, under the act of March 2, 1889, the work was placed under a board composed of Maj. George B. Davis, judge-advocate, United States Army (now Judge-Advocate-General), Mr. Leslie J. Perry, and Mr. Joseph W. Kirkley.

This board assumed direction of the publication in July, 1889. On July 1, 1895, Maj. George W. Davis, Eleventh United States Infantry (now brigadier-general, United States Army), relieved Maj. George B. Davis as president of the board, and he was himself relieved, June 1, 1898, by Col. (now Brigadier-General) F. C. Ainsworth, Chief of the Record and Pension Office, War Department. On December 1, 1898, the board of publication was dissolved under the provisions of the sundry civil act of July 1, 1898, and by direction of the Secretary of War the work was continued under the charge of the Chief of the Record and Pension Office. On July 1, 1899, under the provisions of the act of February 24, 1899, making appropriations for the legislative, executive, and judicial expenses of the Government, the War Records Office, which had for many years been in charge of the work of compiling and publishing the records, was merged into the Record and Pension Office.

To compile the official records of the civil war required comprehensive study and laborious effort. The vast bulk of the records and the myriads of documents they contained precluded any definite knowledge of the individual papers themselves. The records filled several capacious buildings and their number was beyond computation, over 2,000,000 telegrams being contained in one file alone, and enormous additions were constantly being received.

The first attempt at arrangement was the placing of the records in chronological order for the convenient detection of duplicates and with a view to the supplying of missing papers. This was followed by a classification by correspondence, telegrams, orders, reports, and returns. Thus arranged, they were put in type, the Union and Confederate documents in separate volumes. Seventy-nine of these volumes were prepared, of each of which 30 copies, subsequently known as "preliminary prints," were printed. No use was made of these "preliminary prints,"

except as printer's copy in the compilation of the later and regular official publication, although the work of compiling and putting them in type continued until a short time prior to the creation of the board of publication in 1889.

In 1878 the Secretary of War decided to omit from the publication:

- (1) Applications for appointments, arms, contracts, discharges, special exchanges, muster in, etc.
- (2) Charges of disloyalty, etc., preferred by private individuals or anonymously against officers, agents, etc.
- (3) Claims of all descriptions.
- (4) Tenders of troops or personal services by individuals.
- (5) Offers of contracts or of inventions.
- (6) Ordinary routine business of bureaus and departments.

And in 1880 the Secretary approved of a further plan of publication, as follows:

The first series will embrace the formal reports, both Union and Confederate, of the first seizures of United States property in the Southern States, and of all military operations in the field, with the correspondence, orders, and returns relating specially thereto, and, as proposed, is to be accompanied by an atlas.

In this series the reports will be arranged according to the campaigns and several theaters of operations (in the chronological order of events), and the Union reports of any event will, as a rule, be immediately followed by the Confederate accounts. The correspondence, etc., not embraced in the "reports" proper will follow (first Union and next Confederate) in chronological order.

The second series will contain the correspondence, orders, reports, and returns, Union and Confederate, relating to prisoners of war, and (so far as the military authorities were concerned) to State or political prisoners.

The third series will contain the correspondence, orders, reports, and returns of the Union authorities (embracing their correspondence with the Confederate officials) not relating specially to the subjects of the first and second series. It will set forth the annual and special reports of the Secretary of War, of the general in chief, and of the chiefs of the several staff corps and departments, the calls for troops, and the correspondence between the national and the several State authorities.

The fourth series will exhibit the correspondence, orders, reports, and returns of the Confederate authorities, similar to that indicated for the Union officials, as of the third series, but excluding the correspondence between the Union and Confederate authorities given in that series.

In the final and regular official publication the instructions referred to above were strictly followed.

From the outset of the work there was a great deficiency of Confederate records. During the last year of the war the reports rendered by Confederate officials were generally meager and incomplete, and toward the close of hostilities many papers of great historical value were intentionally destroyed by their holders and a still greater number was concealed. Others were burned with public buildings or were carried off by relic hunters, and in various ways the official Confederate files were depleted.

In view of the distrust with which the Southern people for a while naturally regarded the movements made by the Government with a view to the procurement of the records of the Confederacy, it is not surprising that the efforts of the Department to complete its Confederate files met at first with slight success. Later, however, as the attitude of the Southern people toward the compilation became more cordial, records were brought from their places of concealment and were secured for the publication, either as gifts, loans, or by purchase. Among those who cheerfully gave access to the records in their possession may be mentioned the former president of the Confederacy, and this example was followed by his widow after his death. From

this source were obtained copies of archives of the greatest historical value.

The War Records Office numbered among its employees several prominent former Confederate officers, and a large percentage of the clerical force employed upon the publication was from the South.

At an early date a question arose as to the admissibility of papers prepared after the close of the war, but requests for the publication of such papers were uniformly denied, with the tacit approval of Congress, on the ground that, under the act approved June 23, 1874, only official documents or authenticated copies thereof could be embraced in the publication. At a later date (act of July 31, 1886) it was enacted by Congress that thereafter the records prepared for publication under the appropriations for that purpose should "contain only the records of the war of the rebellion covering contemporaneous events," and in the appropriation act of October 2, 1888, it was provided that, "before publication of any volume of said records," the Secretary of War should "certify that it only contains the contemporaneous official records of the war of the rebellion." The contents of but one volume were certified by the Secretary of War under the last mentioned act, that volume being the only one sent to press between the date of the act and the appointment of the board of publication provided for by the act of March 2, 1889. It was apparently assumed by the board that the latter act, by which the board was made responsible for the "preparation and publication" of the records, relieved the Secretary of War of the specific duty previously imposed upon him of determining, by personal inspection, that the publication contained nothing but contemporaneous official records.

The published records doubtless contain many errors, but with few exceptions the errors are in the original papers, and an accurate reproduction of such originals necessitated the perpetuation of the erroneous matter contained therein. This is especially true of the atlas, the attention of the Department being continually directed by correspondents to the inaccurate portrayal of topographical features or location of troops. In publishing the documents and maps the compilers have scrupulously refrained from making alterations of any essential details further than such as were necessary to secure typographical uniformity, as in spelling, punctuation, and headings. To have attempted the revision and correction of statements made or matter contained in the records would not only have been contrary to the legislation governing the compilation, but would have involved the Department in heated controversies, and would have indefinitely postponed the completion of the work. Therefore, as before stated, the compilers have striven to publish the records as nearly as possible in the form and verbiage of the original papers.

The total cost of the publication has been: For salaries, \$1,265,895.68; for printing and binding, \$1,479,447.49; miscellaneous expenses, \$113,171.50, making a total of \$2,858,514.67. This, however, does not include the pay of the army officers detailed from time to time for duty in connection with the work.

During the past winter the attention of the Secretary of War was invited to the necessity for action respecting the lithographic stones for the War Records Atlas. These stones, numbering over 2,000, are the property of a private firm which prepared them under the supervision of the Department and furnished from them the several editions

of the maps required from time to time. The firm represented to the Department that it was at a heavy annual expense for the care and storage of these plates, and that in the absence of a prospect of further and remunerative orders it would be unable to keep the costly material locked up in the engravings, but would be compelled to erase the stones and use them in other work. Should this be done, and it be found necessary afterwards to issue additional copies of the atlas, it would entail the expenditure of nearly as much money as in the first instance and a repetition of the care and labor bestowed by the Department upon the preparation of the engravings now in existence.

A similar problem confronts the Department with regard to the stereotype plates of the War Records books. These plates, which are the property of the Government and are in the custody of the Public Printer, number over 138,000 and, including the boxes, weigh over 800,000 pounds, requiring a large amount of space for storage.

In addition to the principal edition of 11,000 copies, small numbers of different volumes and maps have from time to time been authorized by law and printed so as to furnish sets for members of the Fifty-second, Fifty-third, Fifty-fourth, Fifty-fifth, and Fifty-sixth Congresses, and it is fair to presume that, unless definite and final measures are adopted to supply such demands, similar editions will be called for in the future.

Although over 12,000 sets of the work have been distributed throughout the country, but 1,912 sets appear from the distribution records of this office to have been issued to public libraries or educational institutions (exclusive of United States military and departmental libraries), and it is estimated that over 3,000 public libraries and educational institutions possessing collections of 1,000 books or more have never been supplied with the publication.

In view of all the facts stated above, the Secretary of War invited the attention of Congress during its last session to the propriety of printing a final edition of the volumes and atlas sufficient to supply probable demands therefor, thus permitting the destruction of the plates and lithographic stones, but no action was taken upon the suggestion of the Department. It is recommended that the attention of Congress be again invited to this important subject.

DISTRIBUTION OF THE "OFFICIAL RECORDS OF THE UNION AND CONFEDERATE ARMIES."

The joint resolution of Congress approved May 19, 1864, under which the work of compiling the records of the civil war for publication was begun, provided that 10,000 copies of each volume should be printed, to be distributed by the Secretary of the Senate, as follows: 500 copies to the War Department, 1 complete copy to each State library of every State in the Union, and 5 complete copies to public libraries in each Congressional district of the United States, to be designated by the Representatives of the present (Thirty-eighth) Congress from such district; and of the remaining copies 3,000 to be for the use of the members of the present (Thirty-eighth) Senate, and 6,000 for the use of the members of the present (Thirty-eighth) House of Representatives.

No part of the work was printed or distributed under this resolution, and in 1866 the resolution was repealed.

The next legislation on the subject of the distribution of the work was in the deficiency appropriation act of June 16, 1880, which provided that of the 10,000 copies to be printed, 7,000 should be for the use of the House of Representatives, 2,000 for the use of the Senate, and 1,000 for the use of the Executive Departments. It was not specified in this act by whom the distribution should be made, but it is understood that the first five volumes of the work, which were the only ones then ready for distribution, were distributed in 1881 and 1882 by the proper officials of the Senate and House of Representatives.

The distribution of the publication by the War Department was authorized by the act of August 7, 1882, making appropriations for sundry civil expenses of the Government. That act provided for the printing of 11,000 copies of the work, to be distributed as follows: 1,000 copies to the Executive Departments; 1,000 to officers of the Army and contributors to the work, and 8,300 to such libraries, organizations, and individuals as should be designated by the Senators, Representatives, and Delegates of the Forty-seventh Congress, each Senator to designate not exceeding 26 and each Representative and Delegate not exceeding 21 addresses, the remaining 700 copies to be sold by the Secretary of War at the cost of publication with 10 per cent added thereto.

The distribution by the War Department began with Volume VI. This volume was printed in the latter part of 1882, and its distribution was begun in December of that year. In accordance with the allotment provided by the statute, the 1,000 copies for the Executive Departments were apportioned as follows:

	Copies.
To the State Department.....	50
To the Treasury Department.....	50
To the Interior Department.....	60
To the Post-Office Department.....	50
To the Navy Department.....	300
To the Department of Justice.....	50
To the War Department.....	440

Total to the Executive Departments..... 1,000

The 1,000 copies for distribution to officers of the Army and contributors to the work were apportioned as follows:

	Copies.
To officers on the active list having the rank of major or a higher rank.....	441
To other officers on the active list, generally upon promotion to the rank of major.....	382
To retired officers having the rank of brigadier-general or a higher rank, or who had been general officers of volunteers or chiefs of bureaus.....	52
To contributors to the work.....	125

Total to officers of the Army and contributors to the work..... 1,000

The regulations adopted by the Secretary of War for the distribution of the publication, provided that in the event of the death of an individual designated to receive it, the volumes subsequently issued should be regarded as belonging to his personal estate, and should be sent to the address designated by his executors or administrators. In many cases, however, the War Department was unable to locate the legal representatives of the deceased beneficiary, and incomplete sets of the publication thus accumulated. Many of the libraries and organizations designated to receive the work also became extinct, and in the earlier period of the distribution it was the practice of the Department

to request the members of Congress by whom the designations had been made to substitute other addresses to which the further issues should be sent. Efforts were also made to procure the return to the Department of the volumes distributed to the extinct libraries and organizations, in order that the books might be sent to the newly designated addresses; but volumes once distributed could seldom be recovered, and the number of incomplete sets was thus increased. For this reason the practice of asking for new designations in such cases was discontinued. From the causes mentioned, a large number of broken sets of the publication accumulated in the Department, but these have been partially absorbed in the completion of sets authorized by legislation hereafter to be referred to.

The first five volumes of the publication having been previously distributed, as before stated, through the officials of the Senate and House of Representatives, it was provided by the act of August 7, 1882, that Senators, Representatives, and Delegates, submitting to the Secretary of War addresses to which subsequent issues should be sent, should indicate which of the libraries, organizations, and individuals designated by them had already been furnished with the previously published volumes. Only in a few instances was this requirement complied with by members of the Forty-seventh Congress, and, accordingly, on March 4, 1884, the Department issued a circular letter calling for the desired information. A copy of this circular was sent to each library, organization, and individual borne on the distributing list, but to more than 1,200 of the 9,000 circulars sent no answers were received. Upon the information obtained, however, the Secretary of War submitted to Congress an estimate of the number of the first five volumes required to complete the sets of the authorized beneficiaries, as follows: Of Volume I, 5,038 copies; of Volume II, 4,758 copies; of Volume III, 4,126 copies; of Volume IV, 3,865 copies, and of Volume V, 3,679 copies.

Nothing further was done, either by Congress or by the War Department, concerning a reprint of these volumes until, in the sundry civil appropriation act approved August 5, 1892, the Secretary of War was directed to ascertain what number was required to complete the sets in the possession of libraries, organizations, or persons supplied with subsequent volumes under existing law, whether the distribution had been through the War Department or otherwise, and the Public Printer was authorized to furnish, upon the requisition of the Secretary of War, the number of copies of each volume required, to be used exclusively for the purpose of completing the partial sets already distributed. Under this provision of law circulars similar to those previously used for the same purpose were sent to all of the beneficiaries on the War Department lists, and from the replies received it appeared that about three-fourths of the number of libraries, organizations, and individuals designated to receive the publication had not been furnished with the first five volumes. An edition of 7,500 copies of each of these volumes was therefore printed and the persons and organizations reporting the nonreceipt of the earlier edition of the same volumes were furnished with copies thereof.

On February 16, 1888, a resolution was adopted by the Senate requesting the Secretary of War to report what members of the Forty-seventh Congress had furnished lists for the distribution of the records, as provided by law, and the number of each volume remaining undis-

tributed. The response to this resolution showed that 278 sets remained undisposed of, and it was accordingly provided by Congress, in a joint resolution approved March 10, 1888, that the copies of the publication remaining undistributed of the quota of ex-members of Congress should be placed to the credit of, and distributed upon the orders of their successors in the Fiftieth Congress, those standing to the credit of ex-members who, in consequence of changes in the boundaries of Congressional districts, had no direct successors in the Fiftieth Congress, to be placed to the credit, *pro rata*, of the several Representatives of the States in which such districts were located who were not Representatives in the Forty-seventh Congress. Under this resolution the remaining 278 sets of the 11,000 printed under the provisions of the act of August 7, 1882, were distributed to the libraries, organizations, and individuals designated by the Senators and Representatives of the Fiftieth Congress authorized to make the designations.

In the act of August 5, 1892, making appropriations for sundry civil expenses of the Government, it was provided that 500 copies of the publication should be printed and bound under the direction of the Joint Committee on Printing, for the use of Senators, Representatives, and Delegates of the Fifty-second Congress. These were distributed by the officials of the Senate and House of Representatives.

In the act of January 12, 1895, providing for the public printing and binding and the distribution of public documents, the Secretary of War was authorized and directed to furnish a complete set of the records to each Senator and Member of the Fifty-third Congress not already entitled by law to receive it; and for this purpose the Secretary was authorized to use such incomplete sets, not including any to the credit of Senators, as remained on hand uncalled for by beneficiaries designated to receive them under previous acts. This edition consisted of 186 sets and was distributed in accordance with the provisions of the statute.

The sundry civil appropriations act of June 4, 1897, contained a provision by which the Secretary of War was authorized to furnish a complete set of the records to each Senator, Representative, and Delegate of the Fifty-fourth Congress who was not entitled by previous legislation to receive it. This act contained a similar provision to that of January 12, 1895, relative to the use of incomplete sets remaining on hand. The edition comprised 200 sets, which were distributed as required by the terms of the law.

By a concurrent resolution passed by the Senate June 17, 1898, and by the House of Representatives January 26, 1899, the Secretary of War was authorized to furnish one complete set of the publication to each Senator, Representative, and Delegate of the Fifty-fifth Congress not previously entitled by law to receive it, using for the purpose such incomplete sets as remained unsold or uncalled for by beneficiaries designated to receive them. The distribution of this edition, consisting of 162 sets, has recently been completed.

The latest legislation on the subject of the distribution of the records was in the sundry civil appropriation act of June 6, 1900, in which the Secretary of War was authorized to furnish one set to each Senator, Representative, and Delegate of the Fifty-sixth Congress not before entitled to receive it, and in addition thereto to furnish two complete sets to each Senator, Representative, and Delegate of the same Congress, irrespective of his having been already supplied, using

for the purpose, as far as possible, those remaining unsold or unclaimed. The edition authorized by this enactment will consist of 1,070 sets. Those not required for the personal use of members of Congress have already been received from the Public Printer and are being distributed in accordance with the designations received from the Senators, Representatives, and Delegates authorized to make them.

In addition to the 11,000 copies of the work authorized by the act of August 7, 1882, and the smaller editions, partial and complete, authorized by subsequent legislation, there have been printed an average of about 1,840 copies of each volume for the use of Congress under the general laws relating to the printing of public documents. About 1,200 of these were retained in the office of the Public Printer, to be bound and distributed as a part of the series of Congressional documents, and the remainder, unbound, were delivered at the document rooms of the Senate and House of Representatives. These latter volumes were not all used for the purposes for which such documents are reserved, and an average of about 250 copies each of a large percentage of the volumes were turned over to the War Department, where some of them were used in completing the sets authorized by special legislation during the period of publication. About 2,000 of these volumes, incomplete sets, slightly damaged and unfit for binding, were sent by direction of the Secretary of War to the several homes established for the care of former soldiers of the Union and Confederate armies.

The atlas which forms a part of the publication was published in parts of five sheets or plates each, inclosed in paper covers, and in that form was distributed to all beneficiaries from the office of the engraver in New York, under the supervision of a representative of the War Department.

The distribution of these records involved much labor, but the volumes were issued as rapidly as they were received from the Public Printer, none of them being delayed more than a few days after their delivery at the War Department.

The books, including the general index, distributed by the War Department under existing laws, will number about as follows:

	Copies.
Designations by members of the Forty-seventh and Fiftieth Congresses ..	1,062,400
Executive Departments.....	128,000
Officers of the Army and contributors to the work.....	128,000
Designations by members of the Fifty-third Congress.....	23,600
Designations by members of the Fifty-fourth Congress.....	25,600
Designations by members of the Fifty-fifth Congress.....	20,736
Designations by members of the Fifty-sixth Congress.....	153,157

Total number of books distributed 1,541,493

The distribution of the atlas will be, approximately, as follows:

Atlas (bound, complete) for Fifty-third, Fifty-fourth, Fifty-fifth, and Fifty-sixth Congresses	copies..	1,618
Atlas (in sheets, comprising 10,997 complete sets)	sheets..	1,979,500
Total number of sets of atlas issued.....		12,615

A tabular statement, published as an appendix to this report, shows the dates on which the first copies of each book were distributed, the cost of printing the regular edition, and the price at which each book was sold to subscribers.

In the appendix will also be found a copy of all laws (exclusive of appropriations) relating to the publication and distribution of the records.

The first five volumes of the records sold to subscribers were sold by the Public Printer, the sales by the War Department having commenced with Volume VI. The number sold by the Public Printer is not known to this office, but from the year 1893, after an edition of volumes I to V had been printed for distribution by the War Department, sales of these volumes were also made by the Department, the average number of such sales being 150 copies of each volume. The total sale by the Department of all of the volumes and parts of volumes during the period of publication to June 30, 1901, was 45,614 books, besides 10,831 parts (54,155 sheets or plates) of the atlas, the proceeds amounting to \$35,322.54, all of which has been turned into the Treasury, as the law directs.

ADDITIONAL SPACE REQUIRED.

The crowded condition of this office, the danger of overloading in some of the rooms, and the urgent need of more space for filing and preserving records, including those of the war with Spain and the Philippine insurrection, are fully set forth in a letter of which the following is a copy:

RECORD AND PENSION OFFICE,
WAR DEPARTMENT,
Washington City, January 25, 1901.

The Honorable
The SECRETARY OF WAR.

SIR: For a long time the Record and Pension Office has had insufficient room for filing and preserving the records in its custody and for the clerks and other employees engaged upon the work of the office. The overcrowding resulting from this lack of room and the weight of records stored on certain floors have been steadily increasing, and have at last become so great that, in my judgment, the health and lives of many employees are imperiled and valuable records are in danger of destruction. It is not in my power to remedy the conditions existing, and I feel it my duty therefore to advise you fully with regard to them, in order that you may take such action in the matter as you may deem to be requisite.

The Record and Pension Office is charged by law with the preservation and custody of the records of, and with the transaction of the business of the War Department pertaining to, the volunteer armies of all the wars in which the country has been engaged, including the revolution, the war of 1812, the various Indian wars, the war with Mexico, the civil war, and the war with Spain. The value of these records can not be estimated in dollars and cents or measured by the mere business needs of the Government. They are the memorials of the nation's heroes, and as such alone they demand and deserve better provision for their care and preservation than almost any other class of records in the possession of the War Department or of any other branch of the Government. From a purely business standpoint, however, and aside from all sentimental considerations, these records are simply invaluable; and the child is not yet born who will live to see the day when reference to them will no longer be necessary. Upwards of one hundred and forty millions of dollars are now expended annually in the payment of pensions, arrearages of pay, bounty, and other allowances, and all of this enormous expenditure is based almost wholly upon evidence contained in the records filed in the Record and Pension Office.

The business of the Record and Pension Office is extensive and important, embracing, as it does, subjects of every conceivable nature relating to the service of organizations, officers, and enlisted men, including the decision of questions involving the expenditure of great sums of money, the interpretation and application of many different laws relating to volunteers, and the furnishing of information from records dating from the earliest history of the Government, for the use and guidance of Congress, the courts, the various Executive Departments, and the public at large. In addition to this, the office is charged by law with the publication and distribution of the Official Records of the War of the Rebellion, and with the compilation and

preparation of the records of the Revolution and the War of 1812 for publication. The clerical force required for the transaction of this business is very large, and the Chief of the Office is charged with a responsibility which is certainly not less than that devolving upon the head of any other bureau either of the War Department or any other Executive Department. No one who has any knowledge of the character and magnitude of the work of the Record and Pension Office will deny that, of all the bureaus of the War Department it is one of the last, if not the last, whose work should be hampered and whose records should be endangered by depriving it of the room necessary for the prompt and efficient performance of its work and for the preservation of its records.

The Record and Pension Office was organized, beginning in July, 1889, by the transfer to it, from other bureaus of the War Department, of many different divisions or sections that were engaged upon work pertaining to the disbanded volunteer armies. The rooms occupied by the records and the clerks of these divisions and sections were, of course, transferred with them.

On September 4, 1889, when the first transfer of records and clerks was practically completed, there had been assigned to this office in the State, War, and Navy building 86 rooms with a floor space of 47,486 square feet. Since that date there have been added to the office the War Records Office and the Confederate Archives Division of the Adjutant-General's Office, which, with their records, employees, and furniture, prior to the time of their transfer, filled 14 rooms with 10,140 square feet of floor space, making, with the 86 rooms originally occupied by this office in 1889, a total of 100 rooms having a floor space of 57,626 square feet. At the present time the floor space comprised in all the rooms under the control of the Record and Pension Office in the State, War, and Navy building is but 54,297 square feet, a loss of 3,329 square feet, the same having been transferred to other bureaus of the Department, chiefly to the Adjutant-General's Office in 1898. But this reduction was only effected by packing records and clerks into rooms that were already so overcrowded that they were a menace to the health of the employees compelled to work in them.

Notwithstanding the fact that the space which originally was barely sufficient for the records and employees of the various divisions now comprised in the Record and Pension Office has been thus materially diminished, it has been necessary to file in that diminished space not only many millions of medical and military index-record cards of the war of the rebellion, the Mexican war, and various Indian wars that have been made since 1889, but also the great mass of records of the early wars in which the country has been engaged, viz, the records of the war of the revolution, of the war of 1812, and of some of the Indian wars, all of which records have been transferred from other Departments under laws enacted since the organization of the office. The laws directing the transfer of these records to the Record and Pension Office also directed that they should be indexed as had been done in the case of the records of the war of the rebellion, and, in compliance with this legislative requirement, several millions of index-record cards have been made and added to the files.

The records and cards thus added to the files occupy 17,198 square feet, or nearly one-third of the total space now at the disposal of the office; but not a foot of space has been allotted to the office for the storage of this enormous additional collection of index-record cards and original records. On the contrary, all these cards and records have been added to the collection previously on file, and the whole actually occupies less floor space by 3,329 square feet than that which was occupied by the original collection of records and the employees at work upon them. To accomplish this result, however, it has been necessary to crowd the rooms with clerks and file cases to such an extent as to greatly hamper the work of the office as well as to endanger the health of those engaged upon it. Many of the clerks are compelled to do their work standing in narrow aisles between rows of file cases, because, in order to make room for the cases, it has been necessary to do away with the desks at which the clerks formerly sat. Furthermore, the weight of the records that have been crowded into these files is enormous, the floors in many of the rooms at the present time being loaded with weights ranging from 212 to 405 pounds to the square foot.

In one of the working rooms, where the weight of records is 289 pounds to the square foot, the files weigh over 36 tons, to say nothing of the weight of the desks and furniture and the moving weight of the clerks.

Whatever may be the limit of weight allowable on the floors of this building, and with regard to this I have no information, it is certain that no more records can be added to those now in the rooms occupied by the Record and Pension Office, because the records in those rooms have been carried up to as great a height as it is practicable to carry them, with the file cases standing close together, as they now do. If the records should be carried higher, it would be necessary to widen the space between the cases, so as to give room for the use of stepladders, and so as to give suf-

ficient light to enable the records to be used. All that would be gained by increasing the height of the file cases would be more than lost by reason of the diminution of the number of cases which can be placed on the given floor space.

But the limit of crowding has been reached, and it is imperatively necessary that provision shall be made at once, not only for the constant increase in the files, due to the large correspondence of the office, which amounted to over 250,000 communications during the last fiscal year alone, but also for the records which must be transferred to this office as soon as the volunteer troops now serving in the Philippines are mustered out of service.

Attention is also invited to the fact that, because of the lack of room in the State, War, and Navy building, it has been found necessary to file, together with other records, the index-record cards containing the military and medical histories of the volunteers of the war of 1812 and the war with Spain in the Ford's Theater building on Tenth street. These cards, which contain the histories of over 700,000 soldiers, and required years of labor by several hundred employees of this office for their preparation, are in constant danger of destruction. The building in which they are stored is not fireproof, has a wooden roof and large openings extending through all the floors from the first floor to the roof, and will almost certainly take fire in case of a serious fire in its immediate vicinity. These cards are in constant use, and the work of the office is delayed by reason of the necessity of sending cases from the main office in the State, War, and Navy building to the Ford's Theater building on Tenth street for a report from the record cards filed there. These valuable records should be at once transferred to a place where they will not be subject to destruction as they now are, and where they will be readily accessible for use in the work of the office.

Even if the Ford's Theater building were not the inflammable structure which it is, the limit of weight allowed for its floors by the engineer officers is too low, and the space available for filing records is too small to permit of any material addition to the records now filed in the building.

The situation indicated in the foregoing statement may be summarized as follows:

1. The Government has no records of greater sentimental and practical value than those in the custody of the Record and Pension Office, and the business of that office is not inferior in magnitude and importance to that of any other bureau of the War Department.
2. The space allotted to the Record and Pension Office in the State, War, and Navy building is overcrowded with records and employees to an extent that is certainly injurious to health and is possibly dangerous to life in more ways than one.
3. Valuable records, for which there is no room in the space allotted to the Record and Pension Office in the State, War, and Navy building, are stored in the Ford's Theater building, where they are not readily accessible to the main office, and where they are in constant danger of destruction by fire.
4. The records now in the Ford's Theater building should be removed to a place of safety, and provision should be made at an early date for the reception and preservation of the records of the volunteers who are about to be mustered out of service, for the large number of record cards that must be made in future, and for the constant increase in the files which necessarily results from the extensive correspondence of the office.
5. It is not known that there is any private building in Washington which is capable of bearing, with any reasonable allowance of floor space, the great weight of the records in question, or in which those records, or any portion of them, can be stored with a due regard to their safety and accessibility for the use of the office.

Very respectfully,

F. C. AINSWORTH,
Chief, Record and Pension Office.

This letter resulted in an investigation, from which it was ascertained that the portion of the State, War, and Navy building allotted to the War Department, which when first occupied was barely sufficient to accommodate the bureaus and offices of the Department, had, by steady accretion to the records and files, become so crowded as to interfere with the efficient transaction of the public business. Thereupon the matter was submitted to Congress February 27, 1901, with an earnest recommendation by the Secretary of War for the construction of a thoroughly fireproof building for the Record and Pension Office. As the matter developed at so late a period in the session, no

action was had by Congress, but as the question is of very great importance by reason of the needs of this office and the congested condition throughout the entire Department, it is believed that the following quotation from the letter of the Secretary of War of February 27, 1901, referred to above, will not be inappropriate in this connection:

It is not possible to obtain more than temporary relief until a fireproof building is erected, to which can be removed some of the records.

For several years the construction of a hall of records for the Executive Departments has been under consideration, and many bills have been introduced in Congress for the purpose. A hall of records, however, would not solve the problem so far as this Department is concerned, except to a very limited extent, for the reason that the records not in current use must be frequently referred to, thus requiring rooms for office purposes, which would not be available in a storage building.

This is especially true of the records of the volunteer armies from the Revolutionary war to the present time, all of which are being arranged, card-indexed, and reported upon. No part of these records could be placed in storage without stopping the work of the office as to the records so stored. They take up a great deal of room which is very much needed for other purposes, but they are too valuable to be removed, except to a fireproof building. In the present location they are crowded, and should have for their proper accommodation 10,000 square feet of additional floor space.

There is no space available for this or other demands, and, therefore, to permanently relieve the overcrowding, I recommend that an appropriation of \$2,000 be made at once for the preparation of plans, specifications, and estimates for the construction of a thoroughly fireproof building to accommodate the Record and Pension Office of this Department.

The War Department occupies 178,794 square feet of floor space in the State, War, and Navy building. Of this, the Record and Pension Office occupies 54,627 square feet, nearly one-third of the entire amount available.

The total amount of floor space occupied by the Record and Pension Office in this building, in the Army Medical Museum building, in the building on Tenth street (not fireproof) known as the Ford's Theater building, and in the two rented buildings (not fireproof), Nos. 610 Seventeenth street and 1712 G street, including the estimated aggregate weight of contents, is as follows:

	Square feet of floor space.	Aggregate weight of contents of rooms.
		<i>Pounds.</i>
State, War, and Navy building	54,627	2,322,385
Army Medical Museum	9,367	325,849
Ford's Theater building	23,573	321,951
610 Seventeenth street	6,264	136,818
1712 G street	2,068	15,638
Total	95,889	3,122,641

A building to accommodate the Record and Pension Office should contain, say, 130,000 square feet of floor space, not including corridors and space required for fuel, boilers, machinery, etc. This estimate is based upon the amount of floor space now occupied, 95,889 square feet; additional room needed at present, 10,000 square feet; for future needs, 25,000 square feet; total, 130,889.

Such a building need not be expensive, but it should be thoroughly fireproof, with vacant ground around it sufficient to prevent danger from fire. When built, the needs of the Department will be fully met for a number of years, as the space vacated will be sufficient not only for the needs of this Department, but will also provide additional room for the State and Navy Departments.

Nothing need be added to the foregoing presentation of the case to show conclusively the necessity for the erection of a fireproof building for the use of the Record and Pension Office, and it is strongly urged that the recommendations contained in the letter of the Secretary of War of February 27, 1901, quoted above, be renewed.

CLERICAL FORCE.

By reason of the satisfactory condition of the business of the Record and Pension Office, notwithstanding the additional work imposed upon the office by the receipt of the records of the volunteer forces of the Spanish war and the Philippine insurrection, and especially because of the saving of labor resulting from the application of the index-record card system to the military and medical records, it is believed that a considerable reduction can be made in the clerical force in the next fiscal year without detriment to the public interests.

This condition has resulted very largely from the commendable industry, faithfulness, and zeal with which the employees of the office have performed their respective duties, and especially from the efficient manner in which the clerks in charge of divisions have discharged the responsible and arduous duties that have been assigned to them.

Since the organization of the Record and Pension Office the percentage of high-grade clerks allowed to it by law has been very much less than that of the other bureaus of the War Department, and to bring this percentage nearer the average of the Department, as well as to accord recognition to some of the employees of the office who, while receiving salaries of lower grades, have discharged the duties of higher grades, the estimate of appropriations submitted for the next fiscal year is greater than the present provision by a few additional clerks of the higher grades. But the estimate is less by 42 in the total number of employees, resulting in a net reduction of \$41,200 in the salaries of the office.

The proposed reduction, added to the previous reductions of 300 in 1894, 50 in 1895, 25 in 1897, and 32 in 1899, which were made possible by the introduction of improved business methods since the organization of the Record and Pension Office, makes a total decrease of 449 in the number of employees, and results in a total annual saving of \$501,540 in salaries alone.

In view, therefore, of the disparity in the number of the higher grade clerkships as compared with the clerical force of other bureaus of the Department, of the large reductions already made in the clerical force of the office and the resultant savings therefrom, which reductions and savings were made possible by the faithfulness and efficiency of the clerks whom it is desired to reward; and in view, also, of the further reduction of the number of employees now recommended and the savings to result therefrom, it is hoped that in making this further reduction Congress will not hesitate to sanction the few promotions requested.

Very respectfully,

F. C. AINSWORTH,
Brigadier-General, United States Army,
Chief, Record and Pension Office.

The SECRETARY OF WAR.

APPENDIX.

LEGISLATION RELATIVE TO THE PUBLICATION OF THE "OFFICIAL RECORDS OF THE UNION AND CONFEDERATE ARMIES."

A RESOLUTION to provide for the printing of official reports of the operations of the armies of the United States.

Resolved by the Senate and House of Representatives of the United States of America in Congress assembled, That the Secretary of War be, and he is hereby, directed to furnish the superintendent of public printing with copies of all such correspondence, by telegraph or otherwise, reports of commanding officers, and documents of every description in relation to the existing rebellion, to be found in the archives of his Department since the first day of December, eighteen hundred and sixty, to the present time, and during the continuance of said rebellion, which may be, in his opinion, proper to be published, [which] said correspondence, reports, and documents shall be arranged in their proper chronological order.

SEC. 2. *And be it further resolved,* That the superintendent of public printing shall cause to be printed and bound (in addition to the usual number) ten thousand copies of such correspondence, reports, and documents, in volumes of not exceeding (as near as may be) eight hundred octavo pages each, which shall be distributed by the Secretary of the Senate as follows, to wit: Five hundred copies to the War Department; one complete copy to each State library of every State in the Union, and five complete copies to public libraries in each Congressional district of the United States, to be designated by the Representatives of the present Congress from such district; and of the remaining copies three thousand shall be for the use of members of the present Senate and six thousand for the use of members of the present House of Representatives.

SEC. 3. *And be it further resolved,* That it shall also be the duty of the Secretary of War to cause a complete index of the matter contained in each volume to be prepared and inserted therein.

SEC. 4. *And be it further resolved,* That all resolutions adopted by either House of Congress at its present session directing the printing of any of the correspondence, reports, or documents, as above contemplated, be, and the same are hereby, rescinded.

Approved May 19, 1864. (13 Stat. L., 406.)

A RESOLUTION to provide for the publication of the Official History of the Rebellion.

Resolved by the Senate and House of Representatives of the United States of America in Congress assembled, That the joint resolution entitled "A resolution to provide for the printing of official reports of the armies of the United States," approved May, nineteen, eighteen hundred and sixty-four, be, and the same is hereby, repealed.

SEC. 2. *And be it further resolved,* That the Secretary of War be, and he is hereby, authorized and required to appoint a competent person to arrange and prepare for publication the official documents relating to the rebellion and the operations of the Army of the United States, who shall prepare a plan for said publication and estimates of the cost thereof, to be submitted to Congress at its next session.

SEC. 3. *And be it further resolved,* That the person whose appointment is hereby authorized shall receive a compensation for his services not to exceed two thousand five hundred dollars per annum, to be paid monthly by the Secretary by [of] the Treasury, out of any moneys in the Treasury not otherwise appropriated: *Provided,* That said compensation shall not be paid for a longer period than two years from and after the passage of this resolution.

Approved, July 27, 1866. (14 Stat. L., 369.)

AN ACT making appropriations for sundry civil expenses of the Government for the fiscal year ending June thirtieth, eighteen hundred and seventy-five, and for other purposes.

To enable the Secretary of War to begin the publication of the official records of the war of the rebellion, both of the Union and of the Confederate armies, the sum of fifteen thousand dollars. And the Secretary of War is hereby directed to have copied for the Public Printer all reports, letters, telegrams, and general orders not heretofore copied or printed, and properly arranged in chronological order.

Approved, June 23, 1874. (18 Stat. L., 222.)

AN ACT making appropriations for the sundry civil expenses of the Government for the fiscal year ending June thirtieth, eighteen hundred and eighty-one, and for other purposes.

For continuing the preparation of the publication of the Official Records of the War of the Rebellion, both of the Union and Confederate armies, and for the printing and binding, under direction of the Secretary of War, of ten thousand copies of a compilation of the Official Records, Union and Confederate, of the War of the Rebellion, so far as the same may be ready for publication during the fiscal year, forty thousand dollars; and of said number seven thousand copies shall be for the use of the House of Representatives, two thousand copies for the use of the Senate, and one thousand copies for the use of the executive departments; and for the compensation of temporary clerks and other employees engaged thereon, the collection of such Confederate records as may be placed at the disposal of the Government by gift or loan, for rent of necessary offices, for fuel, stationery, and incidental expenses, forty thousand four hundred and ninety dollars; and the Secretary of War is authorized to negotiate with the legal representatives of the late Confederate Generals Bragg and Polk for the purchase of their private papers relating to the late war, and said Secretary shall report thereon at the next session of Congress.

Approved, June 16, 1880. (21 Stat. L., 269.)

AN ACT making appropriations for sundry civil expenses of the Government for the fiscal year ending June thirtieth, eighteen hundred and eighty-three, and for other purposes.

For continuing the publication of the official records, and printing and binding, under direction of the Secretary of War, of eleven thousand copies of a compilation of the official records, Union and Confederate, of the war of the rebellion, so far as the same may be ready for publication during the fiscal year, thirty-six thousand three hundred dollars.

The volumes of the official records of the war of the rebellion shall be distributed as follows: One thousand copies to the Executive Departments, as now provided by law. One thousand copies for distribution by the Secretary of War among officers of the Army and contributors to the work. Eight thousand three hundred copies shall be sent by the Secretary of War to such libraries, organizations, and individuals as may be designated by the Senators, Representatives, and Delegates of the Forty-seventh Congress. Each Senator shall designate not exceeding twenty-six, and each Representative and Delegate not exceeding twenty-one of such addresses, and the volumes shall be sent thereto from time to time as they are published, until the publication is completed. Senators, Representatives, and Delegates shall inform the Secretary of War in each case how many volumes of those heretofore published they have forwarded to such addresses. The remaining copies of the eleven thousand to be published, and all sets that may not be ordered to be distributed as provided herein, shall be sold by the Secretary of War for cost of publication with ten per cent added thereto, and the proceeds of such sale shall be covered into the Treasury. If two or more sets of said volumes are ordered to the same address the Secretary of War shall inform the Senators, Representatives, or Delegates, who have designated the same, who thereupon may designate other libraries, organizations, or individuals. The Secretary of War shall report to the first session of the Forty-eighth Con-

gress what volumes of the series heretofore published have not been furnished to such libraries, organizations, and individuals. He shall also inform distributees at whose instance the volumes are sent.

* * * * *

Approved, August 7, 1882. (22 Stat. L., 320.)

AN ACT making appropriations for sundry civil expenses of the Government for the fiscal year ending June thirtieth, eighteen hundred and eighty-four, and for other purposes.

* * * * *

For continuing the publication of the official records and printing and binding, under direction of the Secretary of War, of a compilation of the official records, Union and Confederate, of the war of the rebellion, * * * thirty-six thousand dollars. And the sets of said compilation held by the Secretary of War for distribution to addresses, to be furnished by Senators, Representatives, and Delegates, shall be subject to their order, as now provided by law, until July first, eighteen hundred and eighty-four.

* * * * *

Approved, March 3, 1883. (22 Stat. L., 618.)

JOINT RESOLUTION to amend a resolution approved August seventh, eighteen hundred and eighty-two, providing for the publication of Report of Public Land Commissioner, and for other purposes.

Resolved by the Senate and House of Representatives of the United States of America in Congress assembled, That * * * and also that the regulations for the distribution of the Official Records of the War of the Rebellion, in the act making appropriations for sundry civil expenses of the Government for the fiscal year ending June thirtieth, eighteen hundred and eighty-four, be amended by striking out the words "until July first, eighteen hundred and eighty-four," and substituting therefor "until the expiration of their respective terms of Congressional service."

Approved, June 27, 1884. (23 Stat. L., 276.)

AN ACT making appropriations for sundry civil expenses of the Government for the fiscal year ending June thirtieth, eighteen hundred and eighty-five, and for other purposes.

* * * * *

For continuing the publication of the official records, and printing and binding, under direction of the Secretary of War, of a compilation of the official records, Union and Confederate, of the war of the rebellion, * * * to be distributed as required by act of March third, eighteen hundred and eighty-three, thirty-six thousand dollars: *Provided*, That the time fixed in said act during which said publication shall be subject to the order of Senators, Representatives, and Delegates and shall be extended from July first, eighteen hundred and eighty-four, until July first, eighteen hundred and eighty-five; and any act or joint resolution to the contrary be, and the same is hereby, repealed.

* * * * *

Approved, July 7, 1884. (23 Stat. L., 220.)

AN ACT making appropriations for sundry civil expenses of the Government for the fiscal year ending June thirtieth, eighteen hundred and eighty-six, and for other purposes.

* * * * *

For continuing the publication of the official records, and printing and binding, under direction of the Secretary of War, of a compilation of the official records, Union and Confederate, of the war of rebellion, * * * to be distributed as required by act of March third, eighteen hundred and eighty-three, thirty-six thousand dollars: *Provided*, That the time during which said publication shall be subject

to the order of Senators, Representatives, and Delegates shall be extended from July first, eighteen hundred and eighty-five, until July first, eighteen hundred and eighty-six.

Approved, March 3, 1885. (23 Stat. L., 508.)

AN ACT making appropriations for the legislative, executive, and judicial expenses of the Government for the fiscal year ending June thirtieth, eighteen hundred and eighty-seven, and for other purposes.

Office of Publication of Records of the Rebellion.

* * * And hereafter the records prepared for publication under this appropriation shall contain only the records of the war of the rebellion covering contemporaneous events, arranged chronologically, according to the provisions of the act of June twenty-third, eighteen hundred and seventy-four, making appropriations for sundry civil expenses of the Government for the fiscal year ending June thirtieth, eighteen hundred and seventy-five. And the evidence taken by the court-martial on the trial of Fitz-John Porter, and the arguments made before the court by counsel for the prosecution and defence, together with the report thereon by Judge Holt to President Lincoln and any reply thereto filed with the President before approval of sentence, shall be printed in connection with matter already printed concerning the proceedings of said court-martial.

Approved, July 31, 1886. (24 Stat. L., 195.)

JOINT RESOLUTION providing for the disposition of undistributed copies of the Rebellion Records and other public documents.

Resolved by the Senate and House of Representatives of the United States of America in Congress assembled, That all copies of the Records of the War of the Rebellion * * * remaining undistributed, of the quota of ex-members of Congress, shall be put to the credit and distributed upon the orders of their successors, respectively, in the Fiftieth Congress, in accordance with existing provisions of law: *Provided,* That copies of the above-named documents standing to the credit of ex-members who, in consequence of changes in the boundaries of Congressional districts, have no direct successors in the present Congress, shall be put to the credit pro rata of the several Representatives of the State in which such districts are located, who were not Representatives in the Forty-seventh Congress: *And provided further,* That this resolution shall not be construed as withholding, from parties already named to receive complete sets of said documents, the volumes yet to be issued.

Approved, March 10, 1888. (25 Stat. L., 618.)

AN ACT making appropriations for sundry civil expenses of the Government for the fiscal year ending June thirtieth, eighteen hundred and eighty-nine, and for other purposes.

For continuing the publication of the Official Records of the War of the Rebellion, and printing and binding, under direction of the Secretary of War, of a compilation of the official records, Union and Confederate, * * * to be distributed as required by act of March third, eighteen hundred and eighty-five, thirty-six thousand dollars: *Provided,* That hereafter, before publication of any volume of said records, the manuscript copy shall be submitted to the Secretary of War, and revised by him, and shall not be published until he shall certify that it only contains the contemporaneous official records of the war of the rebellion, as provided for by the "act making appropriations for the legislative, executive, and judicial expenses of the Government for the fiscal year ending June thirtieth, eighteen hundred and eighty-seven, and for other purposes," approved July thirty-first, eighteen hundred and eighty-six.

Approved, October 2, 1888. (25 Stat. L., 539.)

AN ACT making appropriations for sundry civil expenses of the Government for the fiscal year ending June thirtieth, eighteen hundred and ninety, and for other purposes.

* * * * *

For continuing the publication of the Official Records of the War of the Rebellion, and printing and binding, under direction of the Secretary of War, of a compilation of the official records, Union and Confederate, * * * to be distributed as required by act of March third, eighteen hundred and eighty-five, one hundred thousand dollars: *Provided*, That hereafter the preparation and publication of said records shall be conducted, under the Secretary of War, by a board of three persons, one of whom shall be an officer of the Army, to be selected by the Secretary of War, and two civilian experts, to be appointed by the Secretary of War, the compensation for said civilian experts to be fixed by the Secretary of War and to be paid from this appropriation; and the whole work of preparation and publication shall be completed within five years. And from and after the passage of this act the records which have been, or which may hereafter be, selected for publication shall be accessible to the public, under such regulations as the Secretary of War may prescribe, but in no case shall such regulations permit the removal of the original records from the Department building.

* * * * *

Approved, March 2, 1889. (25 Stat. L., 970, 971.)

AN ACT making appropriations for sundry civil expenses of the Government for the fiscal year ending June thirtieth, eighteen hundred and ninety-three, and for other purposes.

* * * * *

For continuing the publication of the Official Records of the Union and Confederate armies, including the atlas of maps and plans, in accordance with the plan approved by the Secretary of War August third, eighteen hundred and eighty, the printing and binding of five hundred copies thereof for the use of Senators, Members, and Delegates of the Fifty-second Congress, to be printed and bound under the direction of the Joint Committee on Printing * * * two hundred and thirty-five thousand dollars.

The Secretary of War is hereby directed to ascertain what number of copies of the first five volumes of the Rebellion Record is required to complete sets of this series in the possession of libraries or persons supplied with subsequent volumes under existing provisions of law, whether such distribution has been through the War Department or otherwise; and the Public Printer is authorized and directed to furnish, upon the requisition of the Secretary of War, the number of copies of each volume required for this purpose, which shall be used exclusively by the Secretary of War for completing such sets, provided the same can be done without any increase of appropriations.

* * * * *

Approved, August 5, 1892. (27 Stat. L., 378.)

AN ACT providing for the public printing and binding and the distribution of public documents.

* * * * *

The Secretary of War is hereby authorized and directed to furnish a complete set of the Official Records of the Union and Confederate Armies to each Senator and Member of the present Congress not already entitled by law to receive the same; and he is further authorized to use for this purpose such incomplete sets, not including any to the credit of Senators, as remain on hand uncalled for by beneficiaries designated to receive them under the authority contained in the Acts approved August seventh, eighteen hundred and eighty-two, and March tenth, eighteen hundred and eighty-eight; and the Secretary of War will call upon the Public Printer to print and bind such volumes or parts of volumes as will enable him to fill out the incomplete sets hereinbefore referred to.

* * * * *

Approved, January 12, 1895. (28 Stat. L., 618.)

AN ACT making appropriations for sundry civil expenses of the Government for the fiscal year ending June thirtieth, eighteen hundred and ninety-eight, and for other purposes.

* * * * *
 For continuing the publication of the Official Records of the Union and Confederate Armies, * * * *Provided*, That the Secretary of War is hereby authorized to direct to furnish a complete set of Official Records of the war of the rebellion to each Senator, Representative, and Delegate in the Fifty-fourth Congress who is already entitled by law to receive the same; and he is further authorized to use this purpose such incomplete sets as remain on hand uncalled for by the beneficiaries designated to receive them under the authority contained in the Acts approved August seventh, eighteen hundred and eighty-two, and March tenth, eighteen hundred and eighty-eight.

* * * * *
 Approved, June 4, 1897. (30 Stat. L., 50.)

Resolved by the House of Representatives (the Senate concurring), That the Secretary of War is hereby authorized and directed to furnish one complete set of the Official Records of the Union and Confederate armies to each Senator, Representative, and Delegate of the Fifty-fifth Congress not already entitled by law to receive the same; and he is further authorized to use for this purpose such incomplete sets as remain unsold or uncalled for by the beneficiaries designated to receive them under the authority contained in the several acts of Congress providing for the distribution and sale of this publication: *Provided*, That the Secretary of War may call upon the Public Printer to print and bind such parts of said work as will enable him to complete the acts herein provided for.

Passed by House of Representatives June 8, 1898.

Agreed to by the Senate with the following amendment:

The provision in the "Act making appropriations for the sundry civil expenses of the Government," approved August fifth, eighteen hundred and ninety-two, providing for the printing and binding of five hundred copies of the Official Records of the War of the Rebellion for the use of Senators, Members, and Delegates of the Fifty-second Congress shall not be construed to prevent the binding of any public document which would otherwise be provided for by the "Act providing for the printing and binding and the distribution of public documents," approved January twelfth, eighteen hundred and ninety-five, which provides "That each Senator and Representative shall be entitled to the binding in half morocco, or material not more expensive, of but one copy of each public document to which he may be entitled."

Passed by the Senate June 17, 1898.

Passed by the House of Representatives January 26, 1899. (30 Stat. L., 1804.)

AN ACT making appropriations for the legislative, executive, and judicial expenses of the Government for the fiscal year ending June thirtieth, nineteen hundred, and for other purposes.

* * * * *
 Record and Pension Office: * * * for continuing the work of preparation, publication, and distribution of the Official Records of the Union and Confederate armies, * * * said work to be conducted, under the direction of the Secretary of War, by the Chief of the Record and Pension Office and the employees under charge.

* * * * *
 Approved, February 24, 1899. (30 Stat. L., 871.)

AN ACT making appropriations for sundry civil expenses of the Government for the fiscal year ending June thirtieth, nineteen hundred and one, and for other purposes.

* * * * *
 * * * That the Secretary of War be, and he is hereby, authorized and directed to furnish one complete set of the Official Records of the Union and Confederate armies to each Senator, Representative, and Delegate of the Fifty-sixth Congress now entitled by law to receive the same; and in addition thereto he is also authorized

ized and directed to furnish two complete sets of said work to each Senator, Representative, and Delegate of the same Congress, irrespective of his having been already supplied, using for this purpose, as far as possible, those now stored in the War Department and remaining unsold or unclaimed by beneficiaries designated to receive them under the several acts of Congress providing for the distribution and sale of this publication: *Provided*, That the Secretary of War may call upon the Public Printer to print and bind such number or copies of certain volumes or parts as may be found necessary to complete the sets referred to

* * * * *

Approved, June 6, 1900. (31 Stat. L., 632.)

Statement showing the number of volumes of the "Official Records of the Union and Confederate Armies," the number of pages in each volume, the cost of printing the regular edition, the date of commencement of distribution, and the price at which the volumes have been sold.

SERIES I.

Volume.	Part.	Serial number.	Number of pages.	Cost of printing regular edition.	Price at which sold.	Date of commencement of issue.
1		1	756	\$6,765.76	\$0.50	July 22, 1881
2		2	1,107	9,162.68	.70	Aug. 27, 1881
3		3	822	7,214.34	.55	Dec. 9, 1881
4		4	797	7,091.63	.55	Apr. 17, 1882
5		5	1,209	9,717.92	.75	Sept. 14, 1882
6		6	976	8,776.34	.80	Dec. 2, 1882
7		7	1,026	9,037.17	.85	Apr. 12, 1883
8		8	914	8,106.96	.75	June 15, 1883
9		9	807	7,690.21	.70	Sept. 12, 1883
10	1	10	1,033	8,811.49	.80	Feb. 16, 1884
10	2	11	701	6,409.92	.60	Apr. 25, 1884
11	1	12	1,176	9,696.43	.75	Sept. 15, 1884
11	2	13	1,097	8,943.20	.70	Oct. 31, 1884
11	3	14	751	6,632.32	.55	Jan. 24, 1885
12	1	15	889	7,832.70	.60	May 14, 1885
12	2	16	903	7,643.89	.60	June 29, 1885
12	12	17	825	3,939.30	.35	Dec. 13, 1886
12	3	18	1,035	8,486.91	.65	Aug. 20, 1886
13		19	1,096	8,758.57	.65	Oct. 14, 1886
14		20	1,125	9,165.96	.65	Nov. 24, 1886
15		21	1,272	10,176.03	.75	May 13, 1886
16	1	22	1,248	10,117.69	.75	June 19, 1886
16	2	23	1,112	8,532.78	.65	July 31, 1886
17	1	24	904	7,554.68	.55	Sept. 3, 1886
17	2	25	1,019	7,918.70	.60	Feb. 7, 1887
18		26	1,214	9,415.23	.70	Aug. 8, 1887
19	1	27	1,222	9,898.02	.75	Oct. 21, 1887
19	2	28	821	7,058.15	.55	Nov. 11, 1887
20	1	29	1,122	9,380.36	.70	Jan. 21, 1888
20	2	30	581	5,504.09	.45	Mar. 17, 1888
21		31	1,287	10,155.53	.75	May 25, 1888
22	1	32	1,036	8,456.43	.65	Nov. 28, 1888
22	2	33	1,265	9,944.00	.75	Feb. 13, 1889
23	1	34	969	8,147.12	.60	Mar. 14, 1889
23	2	35	1,090	8,877.00	.65	Apr. 12, 1889
24	1	36	880	7,422.26	.55	Aug. 7, 1889
24	2	37	793	6,800.11	.55	Sept. 7, 1889
24	3	38	1,195	9,696.93	.75	Oct. 2, 1889
25	1	39	1,277	10,581.81	.80	Nov. 8, 1889
25	2	40	975	8,337.93	.60	Dec. 5, 1889
26	1	41	1,048	8,974.82	.65	Mar. 22, 1890
26	2	42	636	6,097.74	.50	Apr. 19, 1890
27	1	43	1,173	10,311.59	.75	Dec. 31, 1889
27	2	44	1,118	9,748.65	.70	Jan. 17, 1890
27	3	45	1,242	10,549.24	.80	Feb. 12, 1890
28	1	46	819	7,917.31	.55	Aug. 7, 1890
28	2	47	672	6,223.28	.45	Aug. 23, 1890
29	1	48	1,163	9,888.91	.70	Sept. 13, 1890
29	2	49	1,074	9,103.66	.65	Oct. 24, 1890
30	1	50	1,174	9,794.52	.70	Nov. 15, 1890
30	2	51	942	8,079.80	.60	Nov. 26, 1890
30	3	52	1,111	9,498.80	.70	Dec. 9, 1890
30	4	53	859	7,566.66	.55	Dec. 29, 1890
31	1	54	973	8,354.60	.60	Jan. 13, 1891
31	2	55	867	7,709.83	.55	Jan. 24, 1891

¹Supplement.

Statement showing the number of volumes of the "Official Records of the Union and Confederate Armies," etc.—Continued.

SERIES I—Continued.

Volume.	Part.	Serial number.	Number of pages.	Cost of printing regular edition.	Price at which sold.	Date of commencement of issue.
31	3	56	1,029	\$8,428.32	\$0.65	Feb. 6, 1891
32	1	57	816	7,351.30	.55	Feb. 25, 1891
32	2	58	967	8,172.61	.60	Mar. 5, 1891
32	3	59	1,018	9,011.75	.65	Mar. 25, 1891
33		60	1,535	12,416.49	.85	Apr. 22, 1891
34	1	61	1,196	10,235.87	.75	May 13, 1891
34	2	62	1,235	10,196.78	.75	June 13, 1891
34	3	63	928	7,962.35	.60	June 27, 1891
34	4	64	807	7,299.07	.55	July 11, 1891
35	1	65	730	6,456.52	.50	July 23, 1891
35	2	66	719	6,416.80	.50	Aug. 3, 1891
36	1	67	1,233	10,070.28	.75	Sept. 21, 1891
36	2	68	1,127	9,660.28	.70	Oct. 9, 1891
36	3	69	986	8,850.80	.65	Oct. 24, 1891
37	1	70	878	7,625.77	.55	Nov. 19, 1891
37	2	71	681	6,396.83	.50	Dec. 11, 1891
38	1	72	1,038	8,923.82	.65	Feb. 19, 1892
38	2	73	988	8,283.90	.65	Mar. 11, 1892
38	3	74	1,109	9,405.90	.70	Mar. 21, 1892
38	4	75	871	7,574.20	.55	Apr. 7, 1892
39	5	76	1,108	9,286.97	.70	May 14, 1892
39	1	77	1,040	8,747.70	.70	June 27, 1892
39	2	78	1,045	8,712.96	.65	Aug. 22, 1892
39	3	79	1,081	8,524.93	.65	Oct. 4, 1892
40	1	80	915	8,231.17	.60	Dec. 20, 1892
40	2	81	796	7,071.53	.55	Feb. 17, 1893
40	3	82	905	7,734.55	.60	Mar. 20, 1893
41	1	83	1,159	9,282.62	.70	May 18, 1893
41	2	84	1,238	8,934.96	.75	July 7, 1893
41	3	85	1,128	9,227.42	.70	July 19, 1893
41	4	86	1,310	11,430.70	.80	Oct. 5, 1893
42	1	87	1,137	9,707.60	.70	Oct. 21, 1893
42	2	88	1,436	11,453.49	.80	Nov. 11, 1893
42	3	89	1,531	12,100.14	.85	Jan. 6, 1894
43	1	90	1,160	9,630.83	.70	Mar. 16, 1894
43	2	91	1,067	8,725.94	.65	Apr. 3, 1894
44		92	1,120	9,296.20	.70	Apr. 24, 1894
45	1	93	1,424	11,734.27	.80	May 31, 1894
45	2	94	983	7,786.09	.60	July 2, 1894
46	1	95	1,508	12,303.56	.85	Dec. 21, 1894
46	2	96	1,493	11,844.67	.85	Sept. 9, 1895
46	3	97	1,549	11,917.14	.85	Nov. 1, 1895
47	1	98	1,249	10,044.77	.75	Jan. 16, 1896
47	2	99	1,587	11,950.56	.90	Mar. 6, 1896
47	3	100	974	7,867.58	.60	Mar. 28, 1896
48	1	101	1,671	13,068.66	.90	June 9, 1896
48	2	102	1,481	11,440.26	.85	Dec. 7, 1896
49	1	103	1,233	9,842.70	.75	Mar. 17, 1897
49	2	104	1,440	11,044.53	.80	May 24, 1897
50	1	105	1,298	9,851.00	.75	June 21, 1897
50	2	106	1,389	10,781.19	.80	July 14, 1897
51	1	107	1,471	11,276.57	.80	Dec. 23, 1897
51	2	108	1,216	9,578.09	.75	Jan. 18, 1898
52	1	109	863	7,696.74	.55	Mar. 17, 1898
52	2	110	928	7,907.21	.60	Apr. 8, 1898
53		111	1,201	9,501.58	.75	July 27, 1898
54 ¹		112				
55 ¹		113				

SERIES II.

1	114	1,050	\$8,774.88	\$0.65	Nov. 17, 1897
2	115	1,636	12,414.62	.90	Feb. 26, 1898
3	116	952	8,069.24	.60	Jan. 9, 1899
4	117	1,022	8,655.52	.65	May 5, 1899
5	118	1,032	8,671.45	.65	June 23, 1899
6	119	1,090	9,518.27	.75	Aug. 2, 1899
7	120	1,373	10,539.76	.80	Oct. 4, 1899
8	121	1,066	9,223.67	.65	Oct. 21, 1899

¹These volumes are reserved to contain such additional matter as it may be decided to publish in future, but no material for them is now in hand, and they will not be issued unless sufficient material to justify their publication shall be secured.

Statement showing the number of volumes of the "Official Records of the Union and Confederate Armies," etc.—Continued.

SERIES III.

Volume.	Part.	Serial number.	Number of pages.	Cost of printing regular edition.	Price at which sold.	Date of commencement of issue.
1.....	122	1,021	\$8,739.71	\$0.65	Nov. 8, 1899
2.....	123	1,013	8,661.73	.65	Dec. 7, 1899
3.....	124	1,260	10,173.90	.75	Mar. 17, 1900
4.....	125	1,356	10,898.60	.80	Apr. 9, 1900
5.....	126	1,111	12,100.08	.85	May 9, 1900

SERIES IV.

1.....	.....	127	1,239	\$9,665.84	\$0.75	May 22, 1900
2.....	128	1,137	9,699.73	.70	June 5, 1900
3.....	129	1,251	10,765.82	.75	June 23, 1900
General Index.....	130	1,236



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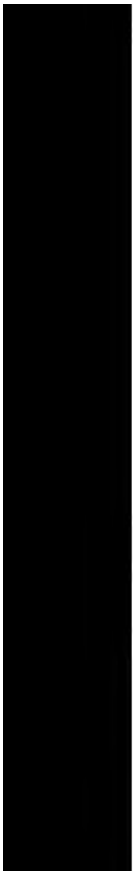
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